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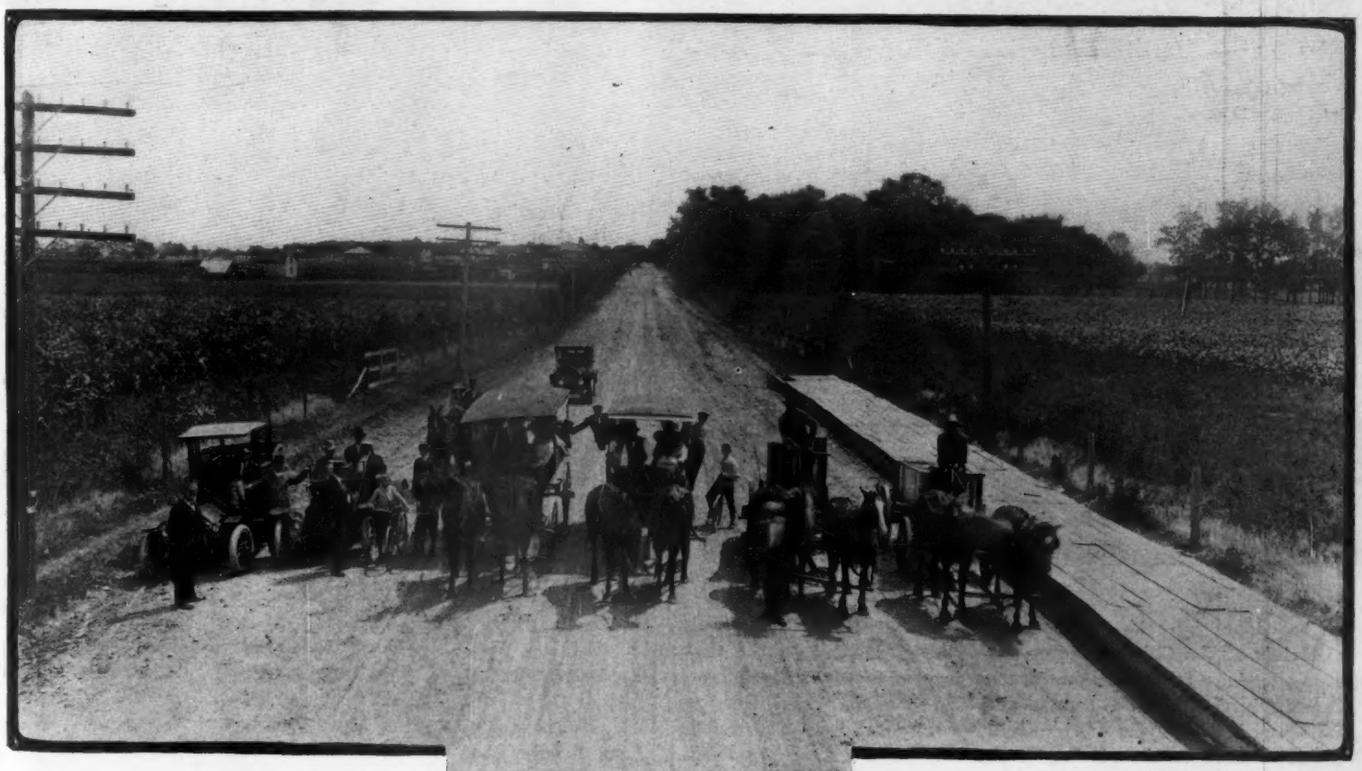
MOTOR AGE

Preparing for National Road Races



THE ELGIN HOMESTRETCH IN FRONT OF GRANDSTAND SITE—SIX VEHICLES LINED UP ABREAST—ROAD 54 FEET WIDE FOR MORE THAN MILE ALONG THIS STRETCH OF HIGHWAY

CHICAGO, July 31—If the third annual stock chassis road races of the American Automobile Association, which will be run at Elgin, Ill., on August 25-26 under the joint auspices of the Chicago Motor Club and the Elgin Automobile Road Racing Association, are not the success they were last year it will not be because of lack of preparation. Here it is a month nearly before the contests are to be run, yet the promoting organizations have reached a state of preparedness that should spell success when the cars come to the tape for the four races—the Elgin National, the Illinois, the Kane County and the Aurora, formerly the Fox River, cup races. This is a showing far better than the one of last year at this time and is most encouraging.

Twenty-six entries already are in; the course practically is completed; the tickets have been placed on sale and already many have been sold; the officials have been named and there remains only the odds and ends of the details to be attended to. It is safe to say that by the middle of August there will be little left

TWENTY-SIX ENTRIES ALREADY IN FOR ELGIN NATIONAL ROAD RACES

ELGIN NATIONAL, UNDER 600 INCHES

Car	Driver
Lozier	Mulford
National	Not named
National	Not named
Alco	Grant
Alco	Lee
Alco	Hartman
Simplex	De Palma
Simplex	Wishart
Pope-Hartford	Buck

ILLINOIS CUP, 451-600 CLASS

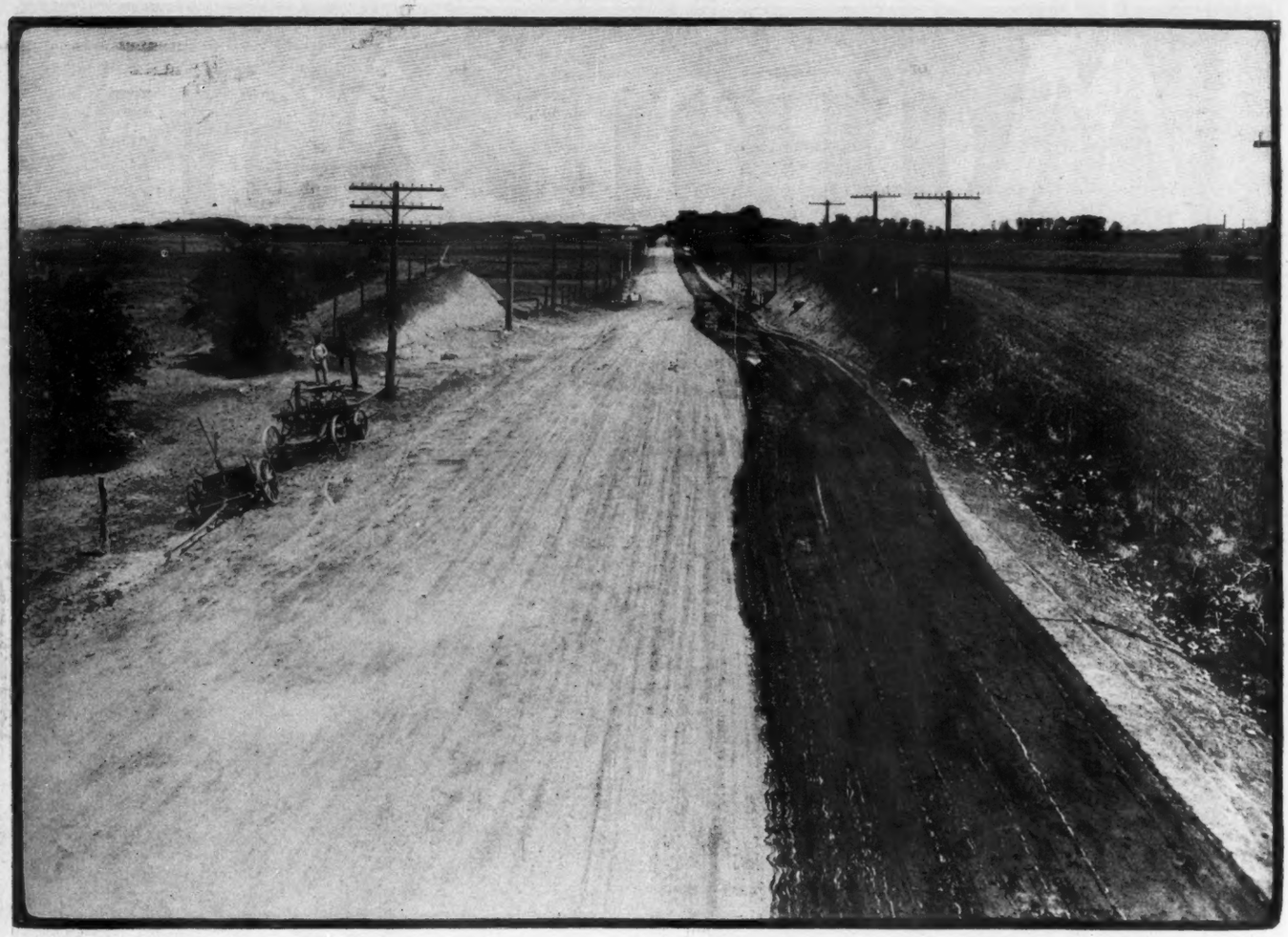
Car	Driver
National	Not named
National	Not named
Velie	Jeffkins
Velie	Stickney

KANE COUNTY CUP, 231-300 CLASS

Car	Driver
Falcar	Greiner
Falcar	Gelnaw
Falcar	Pearce
Staver-Chicago	Monckmeier
Staver-Chicago	Not named
Staver-Chicago	Not named
Calby	Pearce
Colby	Armstrong
Colby	Not named
Cole	Jenkins
Cole	Not named
Corbin	Maisonville

AURORA CUP, 161-230 CLASS

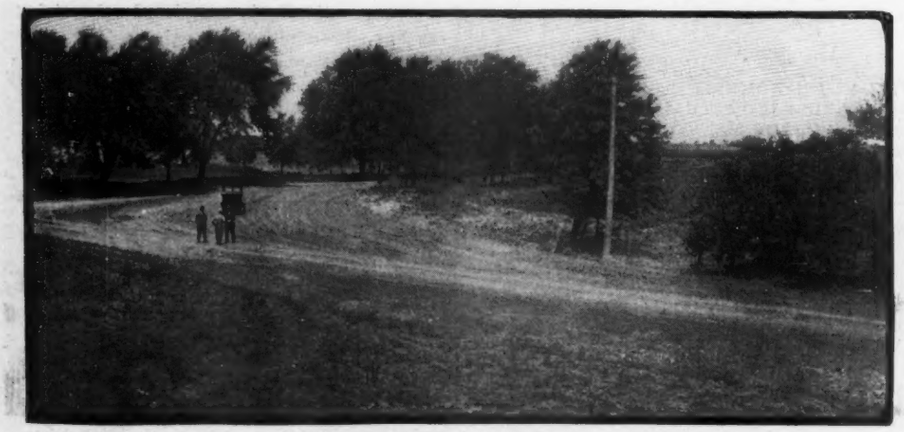
Car	Driver
Abbott-Detroit	Roberts



TO IMPROVE ELGIN HOMESTRETCH BRITTEN'S HILL WAS CUT DOWN AND GRAVEL USED TO WIDEN ROAD TO 54 FEET—BLACK STREAK SHOWS PROGRESS OF OILING ROAD

to be done by the promoting clubs.

Officials of the Chicago Motor Club yesterday made a trip to Elgin for the purpose of inspecting the course and conferring with the officers of the Elgin Association relative to the placing of the bulletin boards and the official stands for judges and the press. The inspection of the course proved an eye-opener to those who had not been out there this year. As before, the course is 8 miles 2,499 feet in length, but the improvements that have been made since last year have been so great that one hardly would recognize the circuit. In the first place, the Elginites have spent $4,000 on the home stretch alone. From Hornbeek's turn at the southeast corner to Britten's hill, on the home stretch, a distance of about 1 mile, the road has been widened from 16 feet to 54 feet so that it will be a perfectly easy matter for at least three cars to run abreast past the grandstand. Britten's hill, which was quite a grade last year, has been cut down considerably and the gravel has been used to widen the stretch. From Britten's for at least another mile to the west the road measures more than 30 feet in width. As a whole, the course is half as wide again as last year.



TURN AT UDINA, DANGEROUS LAST YEAR, HAS BEEN WIDENED TO 100 FEET

Udina Turn Widened

Udina turn at the southwest corner of the circuit has been entirely remodeled. Last year it was a dangerous curve, but now it looks as if a car could make it almost at full speed. By cutting into the field on the inside the road at this point has been widened to 100 feet, an easy swing which gives the drivers plenty of elbow room. The telegraph poles have been moved back from the road and every precaution taken to make the turn a safe one.

The west leg of the course was a country lane a year ago, but now it is one of the best parts of the course. It only is a mile in length, but it seems capable of great speed. The McQueen turn at the northwest corner of the course, which will swing the racers into the west leg going south, also has been improved. Instead of cutting into the bank much the work has been done on the outside.

Circuit in Fine Condition

The east and north legs also are in rare condition. Starting at Hornbeek's, the east leg is only a short dash to McLean's corner. At the latter point the owner of

the property has given permission for the course to cut across his lawn in order to make a wider turn at that place. This will swing the racers into the back stretch which angles into the northwest and which last year was the best part of the circuit. It has been improved if anything and in many places is wider than before. The foundation of this road is good and it required little work to put it into condition for the race.

Averages 24 Feet in Width

As the course is at the present time, it will average 24 feet in width for the entire circuit, whereas in 1910 it barely showed 16. The turns all have been given attention and the only one that has not been widened is at Hornbeek's. There the outer edge of the four corners have been so improved that the turn is much safer.

At the present time the Elginites are engaged in oiling the course. Up to yesterday 24,000 gallons of oil had been put on and there yet remains 50,000 gallons before the work will be completed. Last year only 44,000 gallons of oil were used and yet the course was dustless. Getting such a start at this time, the oil will be permanently set before the circuit is turned over for practice.

The work of constructing the grandstand has not started as yet, but this will not delay matters any. The stand this year is to be 650 feet in length and capable of seating 6,600 people. The boxes will be placed at the top of the stand and will be covered. Each box will hold six persons and sell at $15 a day. In addition, the top three rows of the stand will be covered also and the price of each seat will be $1.50. All other seats in the stand will sell at $1. Parking spaces in Hornbeek's grove—forty-two in all—will sell at $5 each, while any other place on the course will cost $2. There is parking space for more than 20,000 cars.

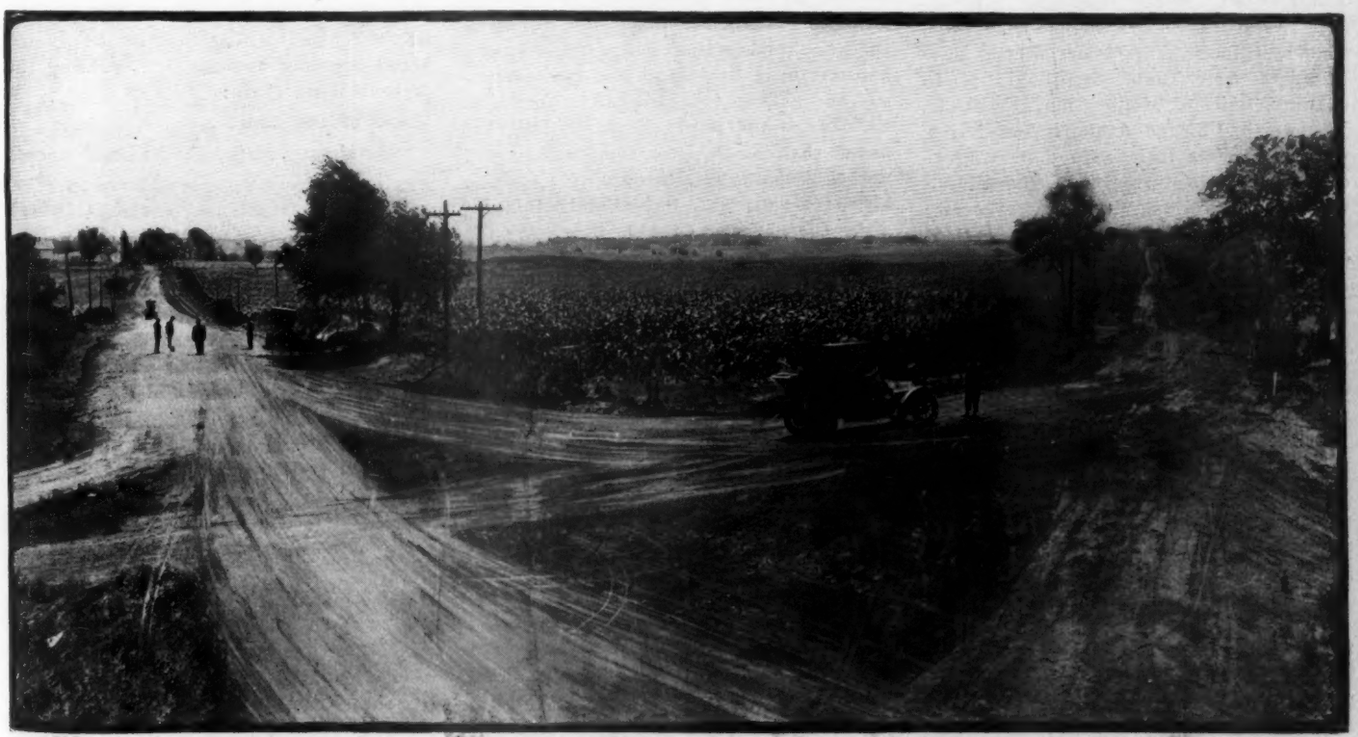
On the inside of the course at the tape will be located the judges' stand, the press stand, a covered stand for invited guests, the hospital tent, the club headquarters and the official cars. The scoreboards will be placed on top of the press stand which is 60 feet in length and capable of accommodating 200 newspaper men. In addition to the main score board, there will be others placed around the circuit, the farmers having stipulated in their contract with the Elgin Association that there be a scoreboard each mile of the course. This is desired in order that the spectators may scatter around the course. The farmers getting 66 2-3 per cent of each general admission ticket sold, and of course they desire that there be inducements to get the spectators to stand on their farms and view the races.

Races Start at 11 O'Clock

It will be easier this year to care for the spectators for the races will start at 11 instead of 10 o'clock. Where the course was closed at 9 o'clock last year, this time the spectators will have until 10:40 to get to their places. Occupants of parking spaces will have until 10:30 to get to their locations.

Here in Chicago, the Chicago Motor Club has been engaged in arranging the details of its end of the promotion and in getting entries. The list of officials which was made up today shows that in handing the plums out the Chicago Motor Club

BACKSTRETCH AT ELGIN HAS BEEN VASTLY IMPROVED



TURN AT McQUEEN IMPROVED BY WIDENING THE TURN—ILLUSTRATION SHOWS NORTH LEG LOOKING EAST AND WEST LEG LOOKING SOUTH

has not picked all local men. The various trade organizations have been recognized and prominent city officials have been asked to serve. It may be, too, Governor Deneen of Illinois will be present the first day, when he will be in Elgin to review the troops which will be in camp there at that time.

Officials of the Meet

The honorary referee of the meet will be George E. Hunter of Elgin, representative of the Elgin Watch Co., which gave the Elgin National trophy. The referee will be David Beecroft, president of the Chicago Motor Club. Honorary judges include: R. P. Hooper, president American Automobile Association; Carter H. Harrison, mayor of Chicago; George Tiedeman, mayor of Savannah, Ga.; Harvey Granger, president Savannah Automobile Club; C. H. Hurlburd, president Elgin Watch Co.; W. E. Metzger, president National Association of Automobile Manufacturers; S. A. Miles, general manager National Association of Automobile Manufacturers; Charles Clifton, president Automobile Board of Trade; Carl G. Fisher, president Indianapolis Motor Speedway Co.; Asa Candler, president Atlanta Automobile Speedway Co.; Hugh Chalmers, Detroit.

The active judges will be: N. H. Van Sicklen, Sr., Chicago Motor Club; Everett C. Brown, president Amateur Athletic Union; T. J. Hyman, Chicago Automobile Club; Allen S. Ray, Chicago Automobile Club; W. Rufus Abbott, president Chicago Athletic Association; Walter Egermann, Aurora Automobile Club; H. B. Hemens, president Elgin Automobile Road Race Association; W. C. Thorne, Chicago Athletic Association; Thomas J. Hay, Chicago Motor Club; Henry Paulman, Chicago Motor Club; James E. Plew, president Aero Club of Illinois; Harold McCormick, vice-president Aero Club of Illinois; J. K. Stewart, Chicago Motor Club; Frank W. Wentworth, Chicago Athletic Association.

Other officials include Fred J. Wagner of New York as starter; A. J. Banta, Chicago Motor Club, as clerk of the course; J. P. Frisby, Chicago Motor Club, chief timer; F. E. Edwards, Chicago Motor Club, chairman technical committee, and R. A. Wadsworth, Chicago Motor Club, announcer. Charles E. Gregory, chairman of the club's contest committee, also holds the title of chief executive. The Warner electrical timing instrument will be used.

In recognition of the generosity of the Aurora Automobile Club in donating the cup for the 161-230 class on the first day, it has been decided to call that trophy the Aurora cup instead of the Fox River.

Twenty-six Entries Now in

Up to Monday there had been twenty-six nominations made for the four races, the last ones to register being two Simplexes, two Velies, a Pope-Hartford, an Abbott-Detroit and three Colbys. Four or five more are looked for this week.

Court Sustains the Weed Patents

Decision Handed Down in Chicago Which Decides Against Excelsior Supply Co. and Motor Appliance Co, in Long Fight Over Anti-Skid Chains—Winner Can Collect Damages

CHICAGO, July 27.—The circuit court of appeals for the seventh circuit in the northern district of Illinois, eastern division, decided today that the Weed Chain Tire Grip Co., of New York, has won its suit against the Excelsior Supply Co. and the Motor Appliances Co., of Chicago, relative to the validity of the Parsons patent. This patent refers to anti-skid chains for motor car tires, and this decision means that the Weed company is made supreme in this field in that it controls the only patent which covers tire chains that permit of circumferential creeping around the tire and that all others employing such means are infringers. By the decision the Weed company is granted a perpetual injunction against the Excelsior Supply Co. and the Motor Appliance Co. and the Pitts Anti-Skid Chain Co. restraining these concerns from infringement of the Parsons patent by manufacturing, imitating or vending it. The decision also gives the Weed company power to assess or cause to be assessed damages sustained by reason of the infringement and also profits to be accounted for by the defendants.

Decision of Court

This decision is an interesting one in that it has been handed down today by Judges Grosscup, Baker and Kohlsaat, which judges on January 11, 1911, handed down an exactly opposite decision in this same case. This last decision is the same as the first one in the case and handed down by Judge Sanborn in May, 1910. In their January decision Judge Grosscup and his associates held that the Parsons patent was anticipated by what is known as the Maxim and Bardwell patent and that meant that the field for manufacturing of anti-skid chains was thrown wide open to all manufacturers. Immediately this decision was handed down last January the Weed company asked for a re-hearing of the case and the present decision, which reverses their former one, is the result. As it is now, the Weed company is the only one having legal right to manufacture anti-skid chains with a circumferential creep. The Weed company owns the Parsons patent.

Attorneys for the Weed company state that suit has been pending for some time against several other companies engaged in the tire chain business for infringement of the Parson patents, some of these concerns being: H. Channon Co., Milwaukee Auto Specialty Co., Garage Equipment Co., Chicago Chain and Mfg. Co., Auto Chain Repair Co., Leo Rabin, William Wooster, E. J. Edwards, Stewart Smith, etc., all of which concerns are engaged at the present time in the manufacturing or selling of infringing chains.

In arriving at this, their latest, decision, Judges Grosscup, Baker and Kohlsaat had their chief difficulty in conjunction with the Maxim and Bardwell patents and in their decision they speak of this patent as follows: "Patent No. 681,173, issued October 20, 1901, to Maxim and Bardwell for a detachable traction strip is the only alleged anticipating device upon which we have had any trouble. One question of fact arises in connection with this patent, namely, were the transverse strips or some of them intended to pass around the felloe of the wheel or was it left optional to thus fasten them or not? The Parsons patent having been granted by the patent office the burden is on the defendant to show anticipation. This burden the defendant has not clearly met. Were the case to turn on this question of fact we would be inclined to hold that the Maxim and Bradwell patent contemplated that the device was to be thus—rigidly—fastened upon the wheel by such straps more or fewer in number. It is not necessary, however, that we should thus hold."

From this it is apparent that the court decided that the Maxim and Bradwell patent referred to an anti-skid chain which strapped to the wheel spokes, and made it impossible for the chain to creep circumferentially around the tire, which, by the way, is the pith of the Parsons patent.

Following this the court's version of the Parsons patent is stated as follows, the Parsons patent being that owned by the Weed company and the one covering the present Weed chain:

Views of the Court

"As already stated the Parsons concept was an entirely novel one in connection with motor car skidding devices. It contemplated in operation two features: One, that as a method of gripping the ground, thereby obtaining traction, the transverse chains next the ground should lie loosely on the ground; and, two, that as a protection to the tire the transverse chains should move circumferentially around the tire—and not that slow circumferential movement that is an incidental event to the close fitting devices, but an easy circumferential movement—a movement that instead of being a mere incident is one of the functions of the adjustment. In the Parsons concept the transverse chains, instead of being practically an integral part of the wheel taking hold of the ground, are a part of the ground upon which the rubber of the wheel takes hold, and the circumferential movement instead of being a forced movement resulting from the hammering of the transverse chains

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Perpetual Injunction Against the Losers

Judges Grosscup, Baker and Kohlsaat Restrain Others From Infringement of the Idea of Parsons and Forbid Manufacture, Imitation or Vending of the Device by the Defendants

upon the ground is a movement that results from the mere looseness of the adjustment; and these two distinct purposes of the concept find their mechanical embodiment in the utilization of the two rings smaller in diameter than the periphery of the wheel, inclusive of the tire, so they cannot come off, but long enough that the transverse chains, as they approach the ground in the revolution of the wheel, fall loosely from the tire by gravity, thus falling loosely upon the ground in advance of the wheel, and thus, also, causing them to advance circumferentially on the wheel.

Maxim and Bardwell Patent

"The Maxim and Bardwell patent, on the other hand, was meant to be tight-fitting—in effect an integral portion of the wheel—either because of the material used or of the auxiliary means of attachment; for anything else that a tight-fitting sheath would not only destroy, in that device, the transverse straps, by rolling them up as the wheel proceeded, but would destroy the tires also by turning in upon them the pins that the patent contemplated the straps should contain. In other words, Maxim and Bardwell had neither the concept of transverse straps being laid upon the ground upon which the rubber should take hold—the Parsons concept—nor the concept of circumferential motion as a function of the device and due to the looseness of the adjustment—the Parsons concept—not the mechanical arrangement or embodiment that in operation would bring about that result.

"True, this difference, so far as it is a difference, in mechanical arrangement and embodiment, is a difference largely of what we call the looseness or tightness of fitting of the rings upon the wheel. But this does not make it, in our judgment, a difference of degree only. It is just this looseness of fitting that makes the Parsons concept, in both of its purposes, practicable; and if the Maxim and Bardwell be practicable at all, it is just this absence of loosenes of fitting that makes it so. In mechanical embodiment, therefore, as well as in concept, there is a something that is present in the one and absent in the other—separates the one from the other—causes the one to operate differently than the other. True, that something is what may be called arrangement or adjustment. But where arangement or adjustment makes operative and practical what was before inoperative and impracticable and is not itself so obvious that its utilization is not of higher merit than the mechanic's skill, arrangement or adjustment may be the basis of invention. In our judgment the arrangement or adjustment of the Parsons concept would never have been thought of in connection with this use, outside the Parsons concept, and it is our judgment that the Parsons concept discloses invention of patentable merit.

"Our study of the alleged infringed devices convinces that they come within the concept of Parsons and its mechanical embodiment. The transverse chains on these devices are not tight-fitting and are not intended to be tight-fitting, subject only to the circumferential movement that comes from hammering on the ground. What might be called the law of structure prevents their being tight-fitting. True, Parsons has no patent on the law of the structure as such. But, he was the first to see the advantage of such a structure and to construct accordingly. And what he has done and patented cannot be trespassed upon with impunity simply because the law of structure necessarily turns what, in pretense or appearance what may be called a tight-fitting device is a loose-fitting device."

The Parsons patent, letters patent No. 723,299, issued March 24, 1903, to Harry Parsons for a new and useful improvement in anti-slipping and anti-puncturing devices for the tires of vehicles and for light purposes, contains among its claims the following:

The Parsons Claims

1. Anti-slipping or protective means for the peripheries of wheels, pulleys, or the like comprising attaching elements at opposite sides of the wheel and an anti-slipping or protective medium secured to the attaching elements and extending across and around the periphery of the wheel, said parts being disconnected from, though retained on the wheel, whereby the anti-slipping or protective medium is free to move or shift its position around the periphery thereof.

6. Anti-slipping or protective means for the peripheries of wheels, pulleys and the like comprising two rings or annuli at the opposite side of the wheel, and an anti-slipping or protective medium consisting of a chain or chains secured to the rings and extending across and around the periphery of the wheel, said parts being disconnected from but retained on the wheel whereby the anti-slipping or protective medium is free to move or shift its position around the periphery thereof.

In describing the purpose of the patent, the patentee stated:

"It has been proposed to guard against slipping and puncturing by an anti-slipping device in the tire itself which slows this considerably and causes disintegration. . . . I overcome these objections by using a separate conception, giving in effect a non-slipping medium between the surfaces of contact, and merely suspending on or engaging with the wheel, but not fixed thereto. . . . My invention consists of a network of rings or strips of metal or a series of small chains or bands, passing from side to side across the tire, and prevented from coming off by two rings or hoops, at either side of the tire."

Before coming to his decision, which has already been given, Judge Grosscup delivered the following opinion:

"The construction of the Parsons device by which it is loose on the wheel and free to travel circumferentially around it when in action gives several important results referred to in the patent. In the first place the freedom to travel adds very materially to the anti-slipping device, in effect continuously laying down on the ground in front of the tire a non-slipping medium consisting of a series of loose cross-chains, under conditions affording a maximum of traction results. In the next place, it prevents the disintegration of the rubber tire which, as suggested in the patent in all other proposed constructions, has proven a fatal obstacle to the use of a metal traction device on the rubber tire. Again it prevents the inevitable and objectionable slowing of the tire in action which occurs where metal traction plates or similar parts are incorporated in the tire."

The court at another place adds relative to the Parsons concept:

"It is true that circumferential creeping was not new with Parsons but he was the first to claim and use it, and understood its significance. It is the inevitable law of the rolling wheel. It is even difficult to keep the tire itself from creeping forward on the rim. This tendency has been well understood from the time of the bicycle. All other inventions conceived the notion that this circumferential creeping was a detriment and must be prevented. Parsons was the first to understand that it was beneficial. He, therefore, reversed the prevailing idea, and specified a loose grip. He also contrived a novel means of holding the grip by side rings of smaller diameter than the tire. Neither of these things had been done before."

From a standpoint of priority the Maxim and Bardwell patent, granted October 20, 1901, and the Parson patent, March 24, 1903, are almost 18 months later.

The Weed company began its suit on the infringement of the Parsons patent, which it owned, 2 years ago, suit being brought against the Excelsior Supply Co. The first decision was handed down May, 1910, by Judge Sandborn, who sustained the Parsons patent. This decision was appealed by the Excelsior Supply Co. and the matter taken to the court of appeals. In January, 1911, Judge Grosscup declared that the Parsons patent was anticipated by the Maxim and Bardwell patent and huled against the Weed company. Lastly, today, July 27, Judge Grosscup has ruled in favor of the Weed, reversing his old decision. This should close the case, as legal representatives claim it cannot be taken to the United States supreme court. At the same time that this decision against the Excelsior Supply Co. was handed down a similar decision was handed down against the Pitts Anti-Skid Chain Co., J. J. Pitts and Lyle A. Closter.

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Driver the Real Dictator

WHY do they do it?

A company decides to go into the racing field; the first thing it does is to scurry around to secure a driver; the driver obtained, it sits down at his feet and listens. He decides what the car shall be, irrespective of what the present practice of the company is or what it has done in the past. The real engineer takes a back seat, he is not even an "also ran." The driver dictates to one and all; he takes possession of the factory, unless he is persuasive enough to have a new and special factory built in which to carry out his own whims on what a racing car should be. A few weeks or months later the race is run, the car flunks, and the company is blamed, the engineer of the company is blamed and often the driver blames the company, too, because it would not do what he wanted them to do. This is the recompense.

DOES the driver know how to build a car as well as the engineer? If the engineer does not know how he should be got rid of and if the driver is such a car physician then he should be once and for all taken out of the driver's seat. As experience has shown, those companies that allow their drivers to run rampant and design their racing machines have invariably got the worst of the deal. They have discovered, when too late, that perhaps, after all, their old engineer knew a few things about cars and the way to build them.

IT is absurd the way many companies are dictated to by drivers who were never anything more than a mechanic before they got into the racing field. Many concerns have lost tens of thousands of dollars by this procedure. They seem to think that building a racing car is a different proposition from building a touring car. They acknowledge that it requires an engineer to build a touring car, but suddenly seem to become possessed with the fact that a mechanic, and some of them not that, can build a racing machine.

BEFORE many big races manufacturers are worried to death over the hallucinations of the drivers. The company enters three cars; one driver insists on one make of carbureter, and each of the other two has his favorite; when it comes to magnetos it is the same story; the same is true of the motor oil, the tires, the shock absorbers, and even the grease. It would seem that what one driver uses would be impossible with another and vice versa. The answer to all is generally found in the cash prizes that are put up. One driver gets close to one maker who offers so much cash for a victory with his part on the car, so with the others. The net result is that often the factory engineer is crowded into the background when it comes to deciding on carbureters, magnetos, shock absorbers, oil, tires, etc. This quite often goes against the factory, and after the race is over a new array of drivers is looked for.

IF the factories stand on their engineering data and experience when it comes to equipping and building a racing car and they will be better off in the long run. The engineer should know; he is not guided in his selection of accessories by cash prizes; he is supposed to be working for his own individual reputation and that of his factory. Makers are doing themselves an injury by linking up, as many of them do, with drivers who are not engineers and giving them free scope in the factory. This kind of work is not doing the industry any good, it does not make the race any better and it is squandering a lot of money.

REPUTABLE drivers have a right to be consulted and many of them are sufficiently familiar with cars to suggest many short cuts in attaching of parts which experience has given them possession of. The driver should be consulted, he can give the engineer many pointers, on demountable rim equipment, on making suitable bodies, on gasoline and oil details, on balancing, etc., but his suggestions should not usurp the field of the engineer and dictate policies which sound judgment declares to be wrong. The factory should be master of itself. Experience has shown that during the last two years the best racing machines have been those built entirely by engineers who have never driven in a contest. These engineers know the real requisites from an engineering point of view; and if the engineer has the building of the racing car at heart he will attend the races and see for himself the shortcomings of his own and other cars as well as the good points of all of them.

Eliminate the Weight Clause

THE Manufacturers' Contest Association holds its Autumn meeting early in August and, according to announced schedule, one of the points to be taken into consideration is the reduction of the present minimum weight clause in connection with stock chassis, if not the entire elimination of the element. Ever since the present closely-drawn rules defining stock chassis have been in force there has been a clause relative to the weight of such chassis. The rules classify the chassis according to piston displacement. To explain: All cars under 160 cubic inches piston displacement are required to compete in the same class against one another. You would imagine that this piston displacement would be the only method of classification, but not so; on top of it is a requirement that these chassis must weigh 900 pounds or over. Here comes the hardship. If one maker builds a car of this displacement that weighs 850 pounds, owing to higher grades of metal used, he is not allowed to compete because he is under weight. The technical committee has visited his factory and finds that the car is a legitimate stock product; it is made in the required quantities and conforms in every respect to the stock requirements except that it is too light. Why should the Manufacturers' Contest Association or any other organization make impeachable judges out of themselves by declaring what shall be the proper weight of a stock chassis for a given piston displacement? This organization has not said what shall be the proper length of wheelbase, and if it is not over a certain length the car will be not allowed to compete; this organization has not set a minimum tire size; it has not set a minimum diameter of crankshaft bearings; it has not set a minimum tensile strength on the front axle material or the steering parts; it has not said what shall be the minimum frame width. But it has said it must come up to a minimum weight. The man buying a car is more interested in a minimum strength clause than he is in a minimum weight one. The weight limitation feature should be once and for all eliminated in stock chassis. If a car is stock, it is stock if the technical committee passes it and that should end the matter.

Uncle Sam Charts His Good Highways

NEW YORK, July 31—More money is being expended in the good roads movement throughout the United States this year than ever before has been utilized for this purpose. Some results of the work being done by the Touring Club of America in conjunction with the American Association for Highway Improvement towards educating the public to the value of improved highways throughout the country are illustrated in a chart just prepared by the United States office of public roads, which shows that nearly 15,000 miles of transcontinental, interstate and trunk line roads are contemplated in various sections of the country.

Although the chart was prepared by the office of public roads, it does not, by any means, represent all the work that has been projected or is aided financially by the government. The idea in issuing the chart was merely to show the tremendous impetus that lately has been given to the nation-wide movement for improved public roads.

Chat an Interesting One

Practically every state in the union is benefited to some extent by the proposed new highways, and the widespread interest in the good roads movement indicates that the time is not far distant when the United States will be interlaced by a complete system of good roads.

Estimates prepared by the office of public roads show that by improving 20 per cent of the roads of the nation almost the highest point of efficiency could be reached. Twenty per cent of the roads in each state could be improved by an expenditure of an average sum of $3,000,000 per state and the annual saving thereby, in the wear and tear on horses, wagons, and motor cars in the transportation of crops and increased land values, is estimated at over $1,000,000,000.

The chart as prepared by the office of public roads indicates the extent to which the good roads movement has taken hold of every part of the United States. The roads already improved, others merely planned, and many now under construction, literally make a network covering the whole country. With the fulfillment of all these plans, it will be possible to drive wagons and motor cars from the Atlantic to the Pacific coast, and from Vancouver, British Columbia, to Tiajuana, Mexico, and from Montreal, Canada, to Miami, Florida.

The map prepared by the office of public roads, merely for the purpose of gauging the extent of the good roads movement as fostered by individuals, associations and communities, shows the following great highways in contemplation or actually under construction:

From Yellowstone Park to Glacier national park, through Fort Yellowstone, the Big Hole battlefield and other interesting points in the Rocky mountains—a total distance of 450 miles.

The Pacific highway from Vancouver, B. C., to Tijuana, Mexico, a distance of 2,009 miles.

The Memphis-to-Bristol highway, connecting Knoxville, Nashville and Jackson, a distance of 540 miles.

The Lincoln memorial road, from Washington to Gettysburg, 40 miles.

The Sherman, Texas, to Galveston highway, 150 miles.

The Central highway, from Morehead City, N. C., on the Atlantic ocean, to Paint Rock, on the French Broad river, Tennessee, through Goldsboro, Raleigh, Greensboro, Salisbury, Charlotte and Asheville, N. C., 460 miles.

The Dupont highway, from the upper end to the lower end of Delaware, proposed by T. Coleman Dupont, who has offered to advance $1,000,000 toward its construction; length of route, 103 miles.

The Des Moines-Kansas City and St. Joseph trail.

The ocean-to-ocean highway, extending from Cumberland, Maryland, to Tacoma, Washington, passing over the old Cumberland road, through Columbus, Indianapolis, St. Louis, over Boone's Lick trail and St. Louis to Old Franklin, Mo., through Nebraska, Wyoming, Idaho, Oregon and Washington; length of route, 3,800 miles.

The Montreal to Miami highway, passing through Albany, New York, Trenton, Philadelphia, Baltimore, Washington, Richmond, Raleigh, Columbia, Savannah and Jacksonville.

The Lincoln way, from Louisville to Nashville, 150 miles.

The capital-to-capital highway, extending from Washington, D. C., to Jacksonville, through the capitals of the seaboard states; length of route, 1,500 miles.

The Clay-Jefferson memorial highway, from Niagara Falls to New Orleans, via Zanesville, Ohio, Maysville, Ky., Nashville, Tenn., and Meridian, Miss., 1,200 miles.

The Red to Rio highway, from Denison, Tex., to Dallas, Waco, Austin and San Antonio, connecting Houston and Galveston, 600 miles.

Coming Motor Events

*August 3-4-5—Galveston beach races, Galveston Automobile Club.

*August 8-17—Reliability for trucks, Chicago Evening American.

August 10-12-13—Races on Gearhart beach, Portland Automobile Club, Portland, Ore.

August 12—Worcester hill-climb, Worcester Auto Club.

August 12—Reliability run of Quaker City Motor Club, Philadelphia.

August 17—St. Louis reliability run, Missouri Automobile Association.

*August 25-26—Elgin road races, Chicago Motor Club.

September 1—Oklahoma reliability run, Daily Oklahoman.

September 2-4—Brighton Beach races, New York.

September 7-8—Philadelphia track meet, Philadelphia Automobile Trade Association.

September 7-8-9—Track meet, Minnesota State Automobile Association, Hamline track, Minnesota.

September 7-10—Reliability run of Buffalo Automobile Club.

September 12-13—Track meet, State Automobile Association, Grand Rapids, Mich.

September 15—Track meet, Appalachian exposition, Knoxville, Tenn.

September 16—Track meet, Automobile Club and Dealers, Syracuse, N. Y.

September 18-20—Reliability run for trucks of Chicago Motor Club, Chicago.

October 3-7—Track meet, Danbury, Conn., Agricultural Society.

October 7—Fairmount Park road race, Philadelphia.

October 9-13—1,000-mile reliability, Chicago Motor Club.

October 16-18—Reliability run of Harrisburg Motor Club.

November 1—Track meet of Waco Automobile Club, Waco, Tex.

November 2-3-4—Reliability run of Quaker City Motor Club, Philadelphia.

November 9-11—Track meet, San Antonio Automobile Club.

November 4-6—Phoenix road race, Maricopa Automobile Club.

November 9—Track meet of Maricopa Automobile Club, Phoenix, Ariz.

November 27—Vanderbilt road race, Savannah, Ga.

November 30—Grand prix race, Savannah, Ga.

November 30-December 2-3—Los Angeles motordrome.

December 25-26—Los Angeles motordrome meet.

January 6-20—Madison Square Garden show, New York City, Automobile Board of Trade.

March 13-20—Show of Boston Commercial Motor Vehicle Dealers' Association, Mechanics' building, Boston.

January 1-7—Grand Central palace show of Automobile Manufacturers of America, New York City.

January 10-17—N. A. A. M. show in Grand Central Palace, New York.

January 27-February 10—N. A. A. M. show in Chicago.

*Sanction already issued

AROUSING THE VIRGINIANS

Washington, D. C., July 29—"A success in every particular," is the way every member of the scouting party that made a good roads trip to Richmond, Va., and return, regards the trip. The party reached Richmond Tuesday night and was met by a delegation of motorists on the outskirts of the Virginia capital. After being entertained by the Richmond enthusiasts, who are looking forward with interest to the good roads congress to be held there in October, the tourists started back to Washington, reaching here Thursday afternoon.

The feature of the trip was the good roads meetings held at a number of places along the route. P. St. Julian Wilson, state highway commissioner of Virginia, who was a member of the party, had arranged to have the county road supervisors hold their meetings at the time the tourists passed through, and these meetings were productive of much good. Informal talks on the importance of improving the Virginia roads in order to attract motorists from the north, were made by various members of the party, including Frederick H. Elliott, secretary of the touring Club of America; J. E. Pennypacker, secretary of the American Association for Highway Improvements; P. D. Sargent, assistant director, office of public roads, department of agriculture, and Henry MacNair, editor of the Blue Book.

Marmon and Flanders Trophy Winners

Contestants in Long Contest from Twin Cities to Helena Finally Reach Their Goal—Seven of the Nineteen Cars Go Through With Perfect Scores—No Technical Examination

HELENA, Mont., July 29—After 9 days of hard plugging through territory hitherto a stranger to motoring contests, the annual reliability tour of the Minnesota State Automobile Association from the Twin Cities to Helena, 1,350 miles in length, came to an end yesterday with seven of the nineteen cars that started from Minneapolis with perfect scores.

According to the announcement of Referee Dutton today, the Marmon, driven by B. Fawkes, and two of the three Flanders, Nos. 12 and 14, were clean in the regular competition. The Minneapolis Journal trophy was awarded to the Marmon in the touring car class, while No. 12 Flanders was given the Phillips trophy in the runabout class, with the Gregg trophy going to the No. 14 Flanders as second prize. The Colby, which had only 5 points against it, was given the Warner trophy as second prize in the touring car class.

It still is undecided which of four cars will get the special Minnesota State Automobile Association trophy, which was put up for competition among the cars which had not been registered as stock with the American Automobile Association. All four of these—a Pierce-Arrow, a Packard and two Kisselkars—are eligible, for each had a perfect score.

The contest was run under grade 3 of the A. A. A. rules, penalizations being only for work and time and with no technical examination at the end of the run. Had there been one it almost is certain none of the cars would have come through with a perfect score.

The tour was unique in that it was accompanied by a special train on the Great Northern Railroad, furnished by President Louis Hill, which was used by the tourists for a hotel, meals being eaten aboard by the motor travelers. Another feature of the run was the good roads angle. A prize, the Hill trophy, was offered the Montana county having the best roads. By a vote of the contestants this was given the Lewis and Clark county.

Four of the cars in the tour, accompanied by one from Helena, continued from here to Glacier National park, 250 miles farther in the heart of the Rockies, as guests of Louis Hill, president of the Great Northern. A run will be made by motor to Kalispell, a 2-day trip, then follows a 3-day journey on horses through the park. The cars in this trip are the Brictson Pierce-Arrow, which acted as press car on the tour; C. P. Merwin's Corbin, the pacemaker; Louis Hill's Packard and Walter Berkey's Packard. The party is accompanied by the special train.

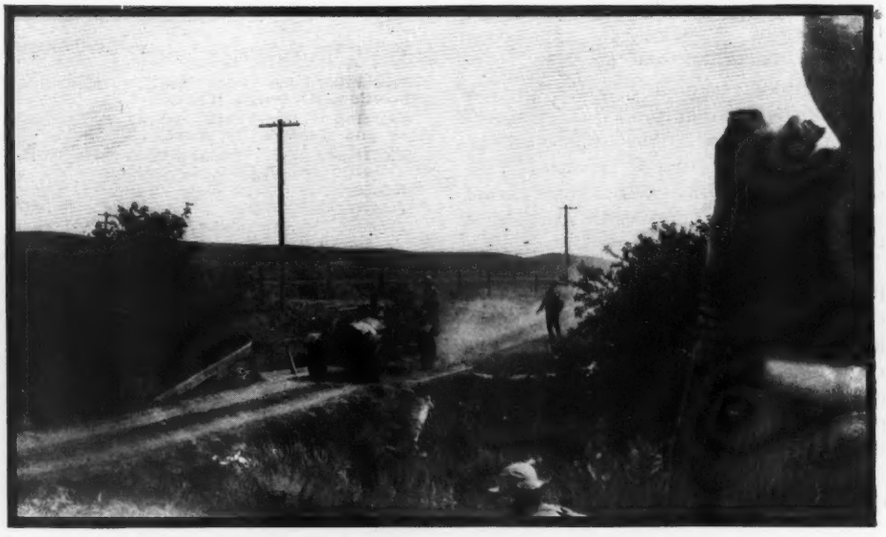
Sixth Day of Tour

Malta, Mont., July 26—The sixth day of the tour was completed with only one mis-

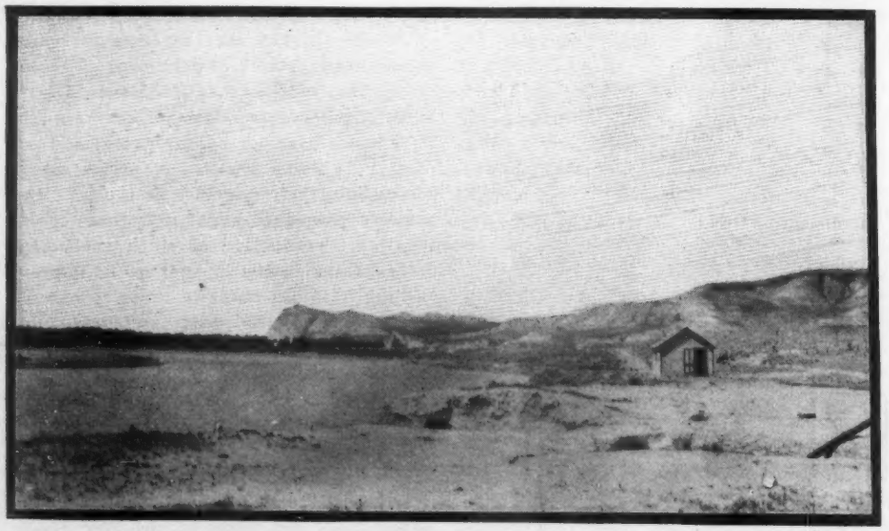
FINAL STANDING OF CARS IN MINNESOTA STATE TOUR

No. Car and driver	1st day	2d day	3d day	4th day	5th day	6th day	7th day	8th day	9th day	Total
1—Maxwell, O. W. Klose	0	0	0	121	0	0	0	21	0	142
2—Marmon, B. Fawkes	0	0	0	0	0	0	0	0	0	0
3—Amplex, R. P. Wiseman	0	0	0	6	14	3	Withdrawn			
4—Halladay, O. A. Palmlund	0	0	0	36	8	0	0	0	0	44
5—*Kisselkar, C. L. Bonwell	0	0	0	0	0	0	0	0	0	0
6—*Kisselkar, C. Rice	0	0	0	0	0	0	0	0	0	0
7—*Pierce-Arrow, J. Suckow	0	0	0	0	0	0	0	0	0	0
8—Hupmobile, E. B. Stimson	0	0	0	0	0	0	7	3	0	10
9—Abbott-Detroit, A. N. Smith	0	0	0	0	0	6	0	0	0	6
10—Stoddard-Dayton, J. H. Prior	0	0	0	180	15	0	0	0	0	195
11—Couby, M. G. Armstrong	0	0	2	0	3	0	0	0	0	5
12—Flanders, B. M. Scott	0	0	0	0	0	0	0	0	0	0
13—Flander, F. A. Witt	0	0	0	0	0	0	Withdrawn			
14—Flanders, G. Herron	0	0	0	0	0	0	0	0	0	0
15—Krit, J. E. Dougherty	0	12	38	0	996	0	0	0	0	1046
16—Petrel, A. L. McNurlen	0	0	3	12	83	12	6	0	0	116
17—Cole, B. T. Hoyt	0	0	5	0	0	0	3	0	0	8
18—Cole, W. L. Rose	0	0	0	461	0	0	0	0	0	461
19—*Packard, W. Stork	0	0	0	0	0	0	0	0	0	0

*Non-registered class



ONCE IN A WHILE A GOOD MONTANA ROAD WAS FOUND



DISCOVERY OF A HOUSE BREAKS MONOTONY OF TRIP

In Minnesota State Association Tour

Marmon is Given Minneapolis Journal Trophy in Touring Car Class While Flanders Gets Phillips Cup in Runabout Division —Colby Rewarded With Piece of Plate—Trip in Detail

hap reported so far, that of the checker's car. All cars were held up today just outside of Glasgow by fake bandits and treated to a reproduction of the old-time saloon and faro joint. All the tourists were forced to drink. Glasgow was the noon control and is noted as being one of the toughest towns in Montana. The day's run was 183 miles and so far the tour has traveled 968 miles.

The checker's car, a Chalmers driven by Van Dusee, which originally was a non-contestant, broke its springs again today. It ran into a coulee 20 miles out of Culbertson and in addition to the springs it broke the windshield and bent the front axle. No one was hurt, and the driver, after repairing the damage done to his car, continued his journey, apparently none the worse for the accident.

TOURISTS ARE TREATED TO AN INDIAN DEMONSTRATION

Trouble Comes on Thursday

Great Falls, Mont., July 27—Thursday was the jonah day for the Twin City tourists for more trouble was encountered today than on any other on the trip thus far. There were not so many cars penalized, but all were late in arriving at controls on account of tire trouble. The regular road from Malta to Havre is very good in dry weather, but a cloudburst the night before made the road along the Great Northern Railroad almost impassable and it was decided to take a longer and much rougher road through the rolling country to the north known as the Mosquito Flats.

This road took the tourists about 20 miles out of the way and within a few miles of the Canadian boundary. The country was almost barren and the trails that wound in and out round the rocky hills were very dim, and the way cut by deep gullies and washouts. Rocks, sand and sagebrush formed the most of the scenery. For 20 miles not a house or animal was seen except coyotes and prairie dogs. It was in this rough country that the tires began to give out and stops for tire repair and replacement were frequent —in fact, some of the drivers claimed that the confetti was not necessary, that the route could be followed by the discarded tube boxes strewn along the way. Some of the aggravated cases included the Abbott-Detroit, which had fourteen blowouts during the day. Three of the official cars came to grief during the day. The Corbin pacemaker, Merwin driving, had seven cases of tire trouble, all of them blowouts, and also broke a spring leaf. This caused the Corbin to lose the pacemaker's flag for the rest of the day as Referee Dutton went on in the Colby. The Colby became pilot as well as pacemaker when it found the Halladay pathfinder with a broken hub and picked up Pilot Harrington.

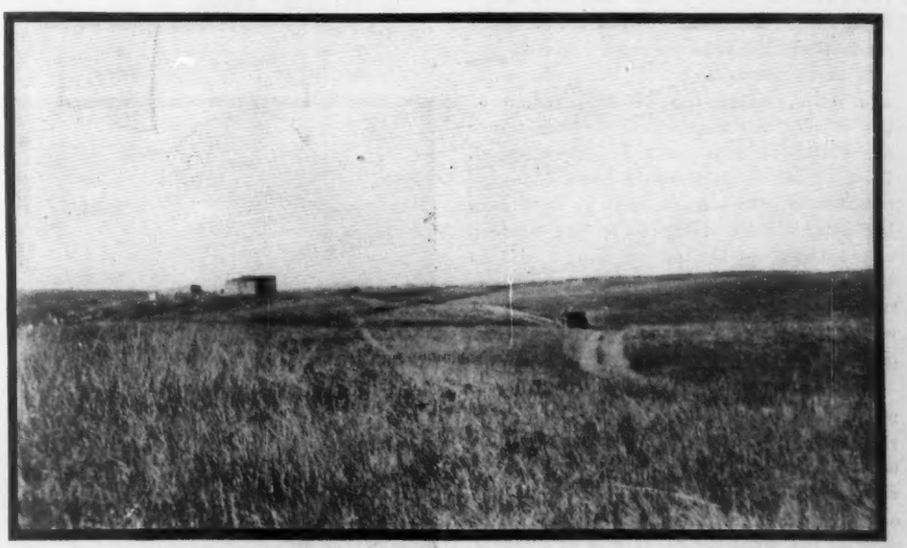
Nearly all the other cars reported much tire trouble. Some of them were delayed for many hours. The Corbin pacemaker was caught by darkness before reaching Fort Benton, but started on the 45-mile drive across the prairies against the advice of the citizens. About 15 miles out of Fort Benton the trail was lost in the darkness and Merwin and his party were lost for several hours. Luckily the railroad was picked up by chance.

The Flanders with the unlucky 13 had magneto trouble and a cracked cylinder and was towed 18 miles by the Abbott. It withdrew from the contest, but followed the tour into Helena. The Amplex froze a bearing near Malta and withdrew.

Finish at Helena

Helena, Mont., July 28—The tourists from the Twin Cities arrived at Helena early this afternoon, completing a run of over 1,300 miles through the most varigated country and over the greatest variety of roads ever witnessed by the members of a motor car reliability tour.

Of the nineteen entrants in the contest seventeen completed the trip and with the three non-contesting cars that finished and the three official cars were escorted into the city by local motorists who met them in Wolf Creek gulch, a half day's journey away. After the final checking in at the Grandon hotel the tourists were escorted to the immense hot springs baths at Broadwater, the largest natatorium in the world. It may be imagined that there



MILE AFTER MILE THE TRAIL RAN OVER THE PRAIRIES

could have been nothing more appreciated by the dusty and sunburned men and women after their 9 days on the road as touring motorists.

The hotel train that had accompanied them from Minnesota was waiting for them when the dust of three states had been scrubbed off and the travelers emerged from the pool. In the evening a banquet was given for the tourists by the citizens of Helena at which the keys of the city were tendered them and addresses of welcome were made by prominent citizens, including the governor of Montana and the governor of Idaho. Louis W. Hill, president of the Great Northern Railroad, who had accompanied the tour as a non-contestant, and the officials of the contest thanked the citizens on behalf of the tourists.

Hazards of the Day

The last day's run of 110 miles from Great Falls to Helena through the mountains was over the best roadbed and yet the most dangerous road of the entire trip. Sullivan hill, a few miles out of Cascade, was the most hazardous spot on the route. This hill led down the side of a bluff at a very steep grade, with one or two sharp turns. The roadway is just wide enough for a car and is covered with round stones which roll under the wheels and cause them to skid where a slip of a few inches would send the car with its occupants hurtling down the precipice to the rocks a hundred feet below. This was such a dangerous spot that after the pilot car, the pacemaker and one or two others had negotiated the hill in safety, Referee Dutton, who rode in the Corbin pacemaker, stationed guards at the top and ordered the other cars to go around by a longer but less hazardous route through the Birdtail Divide. It only was through the efficiency of the brakes and the skill of the drivers that an accident was avoided. The road through the Wolf Creek gulch and Prickly Pear canyon gave the most of the motorists their fill of mountain roads. Here a fine stone roadbed wound between high cliffs on one side and a precipice on the other for miles and miles, where the utmost caution of the drivers was required and where a rate of 10 miles an hour was a dangerous speed. Most of the way it would have been impossible to pass a team had one been met, but guards were stationed at the western end to hold up the people bound east so that for many miles through the mountains the tourists had the right of way which none could question.

Grandeur of Scenery

The grandeur of the mountain scenery more than repaid the motorists for their thrilling trip through it. About 30 miles out of Helena a touch of the old-time west was offered when a mock lynching bee occurred right in the midst of the wildest part of the mountains. It was sufficiently realistic to give the women tourists a shock.

National Fastest on Cincinnati Hill

Wilcox Carries Off Honors in Annual Climb—Joe Dawson in Marmon One of Class Winners—Cino, Oakland and Flanders Among the Successful Ones—Contest Is Well Conducted

CINCINNATI, Ohio, July 30.—Safe, sane and sensible was the hill-climb in this city yesterday afternoon. It was directed by the Cincinnati Automobile Dealers' Association and not a mihsap marred the afternoon's sport. Police ambulances were stationed at the hillside ready in case of an emergency, but though the driving was daring and the chances taken by some of the drivers great, they were not needed.

Chief of Police Jackson was present with a squad of fifty policemen ready to check any panic or excitement that might follow a dangerous accident, but the only duty of the police was to witness exciting events, thrilling finishes and breakneck speed. The crowd was large despite threatening weather conditions and slight drizzles during the afternoon's sport. The course was 2,340 feet and had a grade of 11 per cent and all events had flying starts. The climb was held on Stanley avenue and hundreds of cars lined the start and finish of the dangerous climb.

First honors went to the big National cars, driven by Aitken and Wilcox, and winning three firsts in the time, respectively, of :29 1-5 for event No. 4, :25 1-5 for event No. 5 and :25 1-5 for the closing free-for-all. The Cino, a Cincinnati product, took both firsts in the events that called for four passengers besides the driver. The Ohio, second of the home-made cars, gave a splendid account of itself in the free-for-all, making the course in :32 3-5 and :33 3-5 respectively and shading these records a trifle of a second in event No. 3.

The Marmon, driven by Joe Dawson, managed to land one first prize and that in event No. 3, time :28 4-5. Summary:

CLASS C, NONSTOCK, UNDER 160 INCHES

Name of Car	H.P.	Driver	Time
Empire	20	E. Stone	:51⅘
Flanders	20	L. H. Sackett	:58⅕

CLASS C, NONSTOCK, 161-230 CLASS

Oakland	24	A. Bauer	:40⅘
Elmore	25	W. B. Hambly	:48
Paige-Detroit	—	Wayne Stacey	:49⅕
E-M-F	30	L. H. Sackett	:51⅘
Elmore	25	A. F. Malden	:53⅘

CLASS C, NONSTOCK, 231-300 CLASS

Marmon	32	Joe Dawson	:28⅘
Cino	40	J. Raimey	:32
Ohio J.	—	C. Thatcher	:32⅘
Ohio J.	—	H. S. Mathews	:33⅗
Cino	40	F. E. Radina	:36⅘

CLASS C, NONSTOCK, 301-450 CLASS

National	40	J. Aitken	:29⅕
Marmon	32	E. Stone	:30
Buick	16	H. C. Hisey	:31⅘
Velie	—	R. Jeffkins	:35⅘

CLASS C, NONSTOCK, 451-600 CLASS

National	50	H. Wilcox	:25⅕
Matheson	18	H. C. Dixon	:39⅘

CLUB MEMBERS ONLY

Cino	40	F. E. Radina	:38⅘
National	40	C. Schlear	:40⅘
Matheson	18	J. S. Stevens	:45
American	30	L. H. Sackett	:51⅕

FREE-FOR-ALL, FOUR PASSENGERS

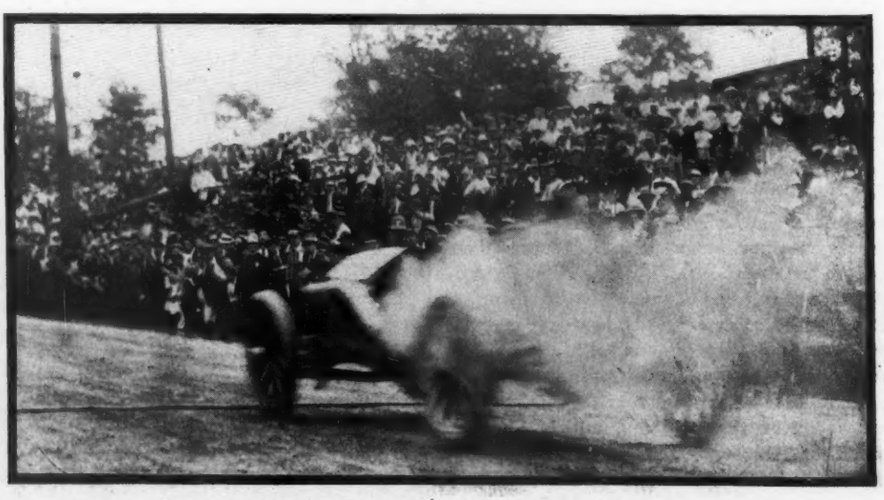
Cino	40	F. E. Radina	:36⅘
National	40	J. Aitken	:39⅘
American	30	L. H. Sackett	:51⅘
Matheson	18	H. C. Dixon	:57

FREE-FOR-ALL

National	50	H. Wilcox	:25⅕
National	40	J. Aitken	:28⅘
Marmon	32	Joe Dawson	:29
Marmon	32	E. Stone	:29⅘
Buick	16	H. C. Hisey	:29⅘
Cino	40	J. Raimey	:32⅘
Ohio J.	—	H. S. Mathews	:32⅘
Ohio J.	—	C. Thatcher	:33⅘
Velie	—	R. Jeffkins	:36⅘
Matheson	18	H. C. Dixon	:42⅘

PARADE AT SEATTLE

Seattle, Wash., July 26—Potlatch week was marked by several motoring events, including a hill-climb and floral parade. The floral parade on the 22d brought out 250 cars and the decorations were novel and varied. The winners were: F. S. Stimson, Mrs. Joseph Blenthen and J. L. Shute in the touring car class; F. S. Stimson in the roadster and runabout division; F. A. Wing and W. Edward Starr in the electric class and the Falcon in the trucks.



WILCOX IN NATIONAL IN CINCINNATI HILL-CLIMB

Minnesota Says Put Date on All Tires

New Law Most Drastic in its Regulations—Motor And Accessories Manufacturers Prepared To Make a Test Case—Makers May Refuse To Ship Casings into State if Law Stands

CHICAGO, July 31—The Minnesota legislature has slipped through a new law which has stirred up the tire trade and which is far-reaching in its effects providing the state authorities try to enforce it. It also is likely to lead to a fight in the courts and may result in Minnesota being cut off from its tire supplies. The Motor and Accessories Manufacturers Association has determined to fight the drastic measure and it is declared that if the law is declared unconstitutional that tire makers will refuse to ship tires into the Gopher state in the future. This also means that the car manufacturers will send their cars to their representatives without the tire equipment. This will leave it up to the Minnesota dealers to find their own tire equipment and upon them will fall the force of the new law.

This new bit of legislation is short and sweet, but most drastic in its provisions and it seems to have been passed without the trade realizing just what it means. The law reads as follows:

Chapter 358. H. F. No. 400—An act to regulate marking rubber tires:

Section 1—No person shall sell any rubber tire or casing for use on motor vehicles unless the name of the manufacturer and the year in which the same was made are conspicuously and permanently marked thereon in raised type cast with the tire or casing.

Section 2.—Any person who shall sell or offer for sale a rubber tire or casing in violation of the provisions of this act shall be guilty of a misdemeanor.

Section 3—This act shall take effect from and after July 1, 1911.

Approved April 20, 1911.

The Motor and Accessories Manufacturers already has taken steps in the matter, having sent its legal representative to St. Paul to look into the bill. Now it is said that the accessories people are waiting for an arrest to be made when they propose going to court and making a test case of it. It is believed that if the matter came into the courts that the law would be declared unconstitutional. If it is upheld it is declared by one prominent tire man that the entire tire trade, through its organization, will stop shipping its product into Minnesota. They say that Minnesota is not so big a market as to make it absolutely necessary for them to do business in that state and that if the law is enforced it will be up to the Minnesota dealers to find their own tires. Car makers, they say, will have to ship their machines without tires. It also will practically kill the business in second-hand cars or else force the dealers to fit new tires on each old car sold; that is, provided the name and date are put on the casings as the law orders.

The tire makers object to the new law on the ground that it does them an injustice. By marking the date on they are likely to meet objection on the part of the purchasers. For instance, 1911 tires made in the fall of 1910 may not get on the market until the middle of this summer and being marked 1910 there likely would be a demand on the part of the purchaser that he get the tires as seconds or old tires. It is declared that the tire makers are a unit in determining to fight the matter, although they will not start the trouble.

UNITED MANUFACTURERS DISBANDS

New York, Aug. 1—The co-operative selling scheme adopted by the manufacturers of Weed chains, Jones speedometers. Mezger windshields and spark plugs, the Connecticut Telephone and Electric Co. and the New York and New Jersey Lubricants Co., which took the form of an organization known as the United Manufacturers, was abandoned today by agreement and the concerns returned to their original plans of disposing of their outputs through their own representatives. While no official statement has been given out, it is understood that the scheme of co-operation in this manner did not work out very well.

Although not banded together any longer four of the concerns which were in the United Manufacturers will still be closely identified with each other in that their goods will be handled by the same concerns. The Connecticut people withdrew from the combination some time ago, leaving four in. Frank E. Sparks, formerly the United Manufacturers' representative in Chicago, has purchased the combination's stock and plant in his city and will represent the former combination as manufacturers' selling agent in Illinois, Indiana, part of Michigan, Wisconsin, Minnesota, the Dakotas, Montana, Wyoming, Colorado, Nebraska, Iowa, Missouri, Arkansas, Oklahoma, Texas and New Mexico. Hughson & Merton of San Francisco have the Pacific coast, and Petry & Cassady of Philadelphia are handling Pennsylvania and the south.

The following statement was issued today by the United Manufacturers: "The United Manufacturers as a sales organization has discontinued the sale of the products of Weed Chain Tire Grip Co., Bridgeport, Conn.; the Jones Speedometer, New Rochelle, N. Y.; New York and New Jersey Lubricant Co., 165 Broadway, New York city; C. A. Mezger, Inc., 229 West Fifty-sixth street, New York city. The desire to avoid the appearance of a combination in restraint of trade is the purpose of this step. The above manufacturers will continue the distribution of their products through the former branch offices of the United Manufacturers in charge of their branch managers."

WHITESIDE STEVENS PRESIDENT

Chicopee Falls, Mass., July 29—At a meeting of the stockholders of the Stevens-Duryea Co., held today, W. H. Whiteside was elected a director of the company. There also was a meeting of the board of directors held, at which Mr. Whiteside was elected president of the company to fill the vacancy caused by the resignation of Irving M. Page. Mr. Page was elected chairman of the board of directors and treasurer of the company.

Outside of an interest which Mr. Whiteside will have in the company, there is no other change in the ownership and control of the securities of the company. A further official statement was made that the company does not contemplate the purchase of, nor the consolidation with any other motoring interests. Mr. Whiteside recently resigned the presidency of the Allis-Chalmers Co., of Milwaukee, and is the man the Stevens-Duryea Co. had in mind when the announcement of the contemplated reorganization was made in Motor Age 2 weeks ago.

WINNER OF FIRST PRIZE IN SEATTLE FLORAL PARADE

START OF 10-MILE HANDICAP AT PHILADELPHIA MEET

October Glidden on a Southern Trail

American Automobile Association Takes Radical Step In Changing Conditions Governing Test—There Will Be No Technical Examination and No Observers Will Be Carried

NEW YORK, Aug. 2—Special telegram—The following official announcement has been made: The Glidden tour for 1911 will take place in October and be run over the route of the national highway, extending from New York to Jacksonville via Atlanta.

Returning to the original idea of the donor of the trophy, the tour, appealing particularly to owners, will be conducted under regulations demanding reliability and regularity without reference to rigid technical restrictions.

It having been made plainly apparent that an endurance tour for the Glidden trophy promoted primarily for owners was generally wanted, and it likewise having been made clear that the makers of motor cars were no longer interested in an exceedingly technical contest, the contest board of the American Automobile Association announces the new plan for the national tour, which is sure to be a pronounced success, the decision having been preceded by a conference with a delegation from the south which brought assurances of generous support.

From the Atlanta Chamber of Commerce and the Jacksonville Board of Trade came representatives who were prepared to negotiate a definite proposition. The A. A. A. conferees were President Robert P. Hooper, Chairman Butler, of the contest board, and Chairman Batchelder, of the executive committee. Atlanta was represented by Edwin P. Ansley and Major John S. Cohen, who are two of the most energetic exponents of highway improvement in the entire south. H. B. Race spoke for Jacksonville and he is another good road advocate; in fact, it was the impetus which would be given to good roads progress in the south that caused the change to a southern route. New England has been the scene of several Gliddens, though postponement to fall brought with it the necessity of proceeding southward rather than northward.

The 1911 tour will be conducted under grade IV of the A. A. A. rules for reliability runs, with practical daily running schedules, possible of accomplishment by any tourist.

The cars will be stamped in their essential parts, there will be no observers and the only penalty assessed will be for lateness at controls. A nominal entry fee of $25 will be charged and present indications point to a large entry list of individual owners.

A $200 cash prize will be offered for the best performance in each of the seven price divisions. Any owner of a stock car shall be eligible to enter. Entry blanks and full conditions will be issued.

DETROIT TRADE GOSSIP

Detroit, Mich., July 29—Factory announcements of 1912 models continue the live topics of conversation in local motordom. Latest in the field are the Flanders Mfg. Co. and the Warren Motor Car. Co., both of which have recently made known their plans for the coming season.

The Flanders Mfg. Co., at Pontiac, has been working for some time on the details of an electric. The fact has been no secret among the trade, and there has been great interest in the details of the car which have been the sources of much gossip. The company has withheld announcement until satisfied with the models which it has been testing. As a result, it is stated that the firm will market a car of the coupe type, the principal feature of which is the ingenious manner in which the wheelbase has been made to seat a body of unusually generous proportions. The Flanders coupe is a five-passenger vehicle which, it is promised, will carry six without much crowding. It is of the colonial type, swung low, but differing from former models of that type in the fact that the motor is obscured from view and that there is no hood visible from the exterior.

The Warren Motor Car Co. has added a great deal of variety to its line, which has hitherto consisted of the various body styles of the one Warren 30 chassis. This type is to be continued, but will be supplemented during the coming season by the addition of a Warren 12-40 and a 12-35, both of which will be more powerful models of the same general characteristics.

Through the efforts of the Detroit board of commerce it seems certain that the city will gain another firm manufacturing motor accessories. Representatives of the Zenith Carbureter Co., of Lyons, France, have been in the city, in conference with the local authorities, and have selected Detroit as the site for manufacturing operations on a small scale, with a view to materially adding to their scope in case the experiment proves a success. Officers and manufacturing space have been secured in the Dodge Power building. It is stated that the company expects to manufacture 20,000 carbureters in its first year. About forty expert mechanics will be brought here from France, according to the statement of the local officials.

LAST GARDEN SHOW

New York, Aug. 1—All doubt as to there being a motor car show in Madison Square garden next winter, which was created by the sale of the old structure some time ago for the purpose of erecting an office building on the site, has been set at rest by the official announcement that the twelfth national show will be held in the garden from January 6 to 20, 1912.

The show committee which so successfully planned and executed the gigantic exhibition of last winter, consisting of Colonel George Pope, chairman; Charles Clifton, Alfred Reeves and Merle L. Downs, secretary, again will have charge of the work of staging the national show.

Like that of last season, the 1912 show will be two shows in one—part 1, which will be held during the week of January 6 to 13, being devoted exclusively to passenger or pleasure vehicles, while commercial vehicles, electric carriages and motor cycles will be shown in the part 2 period, lasting from January 15 to 20. Displays of accessories will be included at both exhibitions.

The amount of preliminary detail to be attended to in bringing about the culmination of a finished show is so big that the committee began its work several months ago. The decorative schemes and

arrangements for spaces, which are the most important things to be considered in an exhibition of this kind, have held the attention of the committee for many months. It is promised that the forthcoming show will be better from every viewpoint than any of its predecessors. The steel and metal construction work which was used extensively in the decorative plan at the last show will again be used throughout the building.

MANY AT QUAKER MEET

Philadelphia, Pa., July 29.—Bob Burman established a new track mark of 58 4-5 on the Point Breeze track with the Blitzen Bens, clipping 4-5 second off the mark set last year by Barney Oldfield in the same car. But Burman was not so fortunate in defending his title to the Remy brassard and trophy, paying $75 a week to the holder, Billy Knipper in a Mercedes wresting that honor from him in the feature event of the day owing to the breaking of a feed pipe.

It would be difficult to conceive of a more ideal day, and in spite of the many counter attractions in other branches of sport, the historic old track was jammed. tI was the annual midsummer meeting of the Quaker City Motor Club and it was one of the most sucessful and most largely attended of its kind. Approximately 10,000 persons were present. Summary:

Ten Miles, 161-230 Class—Joe Grennon, Buick, won, time 12:27; W. P. Padula, Abbott-Detroit, second, 13:19⅘; Harry Baker, Metz, third, time 13:33⅗.

One-mile exhibition for track record, by Bob Burman with Blitzen Benz. Record :59⅗. Burman's time, :58⅘.

Ten Miles, 231-300 Class—Harvey Ringler, Mercer, won, time 11:17⅗; J. DuClosny, Staver-Chicago, second; Bob Morton, Klinekar, third.

Ten Miles, 301-450 Class—Richter, Opel, won, time 12:19⅘; Harry Cole, Jackson, second.

Five-Mile, Free-for-All, Flying Start—Billy Knipper, Mercedes, won, time 5:34⅕; Richter, Opel, second; Bob Burman, Benz, withdrew.

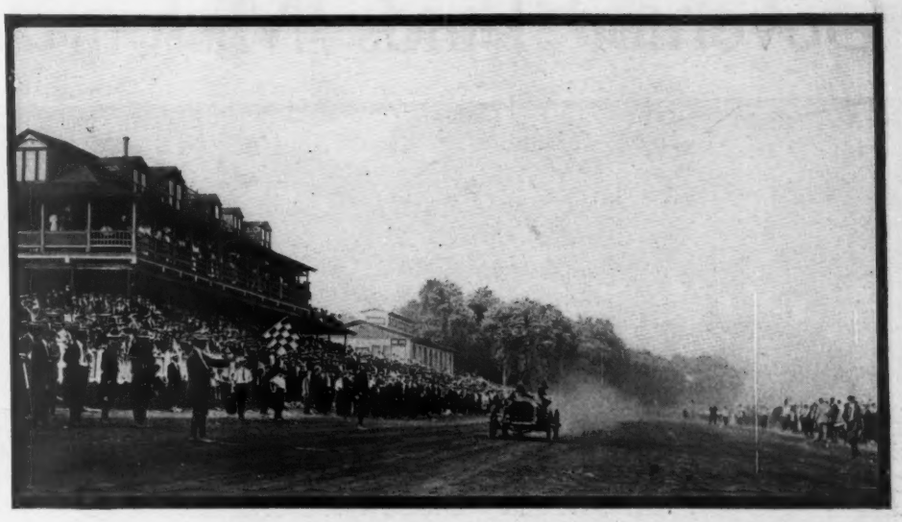
Special Race, 10 Miles—Harvey Ringler, Mercer, won, time 11:39⅖; Hughie Hughes, Mercer,, second, time 11:55; J. Du Closny, Staver-Chicago, third.

Ten-mile Handicap, open to all cars entered in the meet—Harvey Ringler, Mercer (handicap 30 seconds, won, time 10:49; Hughie Hughes scratch, second, time 10:59; J. Grennon, Buick, third.

Twenty-five Mile Combination Race—Hughie Hughes, Mercer, won, time 27:24⅘; Harvey Ringler, Mercer, second.

MUST MAKE BRIDGES STRONG

Pittsburg, Pa., Aug. 1—An important ruling which will affect directly all counties of Pennsylvania has been made by the state supreme court in Philadelphia, sustaining the decision of Judge Trexler, of Lehigh county, in regard to the strengthening of bridges for motor cars. Judge Trexler held that although a bridge which had broken down with a motor truck loaded with 2 tons of flour was sufficient for all demands when erected, it was the duty of the county since the introduction of the motor car to strengthen all bridges to such an extent they would be equal to all traffic requirements. The supreme court confirming this decision means that hundreds of thousands of dollars will be expended within the next year in improving bridges and culverts throughout the state.



RINGLER IN MERCER, WINNING AT PHILADELPHIA

Quaker Tourists Well into Nevada

Premierites Sunday in Reno and Are Keeping to an Average of 150 Miles a Day—End of Long Journey in Sight—Owners are Delighted with the Transcontinental Trip So Far

RENO, NEV., July 30—Covered with the dust and dirt of a score of states, but happy in the belief that it is honest dirt, the forty-odd Premier ocean-to-ocean tourists are taking a respite of 24 hours in this city before pushing on to San Francisco, Los Angeles and other California coast points. Reno was the first important stop after leaving Salt Lake City, and it is the last of importance until San Francisco is reached. The party has been on the road 25 days and more than 150 miles a day has been averaged. That constitutes an unprecedented record. All of the amateur-owner drivers are enthusiastic over the prospects of entering California tomorrow, as they will then feel that they are indeed nearing the end of their long journey. They have many messages to deliver to California officials, received from various officials and dignitaries they have visited en route.

One week ago, between Rock Springs and Kemmerer, Wyo., the speedometers on the ten Premier cars showed that the 3,000-mile mark had been passed. The tourists were greatly enthused then, as they had traveled 200 miles more than the mileage of the 1911 Glidden tour and the only mechanical trouble consisted of two broken springs. Five mountain ranges and two great divides have been crossed at an altitude of 8,000 feet at Tide Siding, Wyo., and 7,500 feet at the continental divide. The plains of the central west, and the bad lands of southern Colorado and Wyoming and seven of America's greatest rivers have been crossed.

The completion of the ocean-to-ocean tour in California next week will mark a new epoch in the annals of motoring. For the first time a party of amateur-owner drivers, accompanied by families and friends, including eight women, will have crossed the American continent in motor cars. For the first time more than one car will have made the trip and for the first time more than one car containing pleasure tourists.

UNCLE SAM'S PRINTER IN MARKET

Washington, D. C., Aug. 1—The government printing office, the largest institution of the kind in the world, is about to substitute motor trucks in its delivery service in place of horse-drawn vehicles. Bids have just been opened by Public Printer Donnolly for furnishing two 1,000-pound electric trucks, two 2,000-pound trucks, two 5,000-pound trucks and an electric landau. Bids were submitted by the General Vehicle Co., Lansden Motor Vehicle Co., Baker Motor Vehicle Co., Emerson & Orme, Detroit electric agents here; Washington Motor Vehicle Co., Studebaker Corporation, Studebaker Brothers Co., Waverley Co., Commercial Truck Co. of America. The award is expected to be made within the next few days. The government printing office is the first federal government department to discard horses entirely.

RACING AT SPOKANE

Spokane, Wash., July 25—Although no records were shattered at the speed program on the Spokane insterstate fair ½-mile track last Saturday, thrills galore were furnished the crowd of nearly 3,000 people. Summary:

Five miles, small cars—H. Hahn, Ford, won; time 8:47⅖.

Five miles, big cars—H. Anderson, Chalmers, won; time 6:55⅖.

Five miles, free-for-all—W. Falk, Corbin, won; time 6:41⅖.

Two miles, pickup—P. Welch, Abbott-Detroit, won; time 4:35.

Governor Finds Missouri Roads Good

MISSOURIANS WHO INSPECTED ROADS OF THE SHOW ME STATE

KANSAS CITY, Mo., July 31—"More money has been spent on Missouri roads in the last 30 days than has been spent in 30 years." Thus spoke Governor Hadley, who had just finished a good roads inspection tour across the state, the like of which never has been known. To understand the governor's plan of getting these counties to build good roads between St. Louis and Kansas City, the following must be known: About a month ago the governor announced by circulars to all the counties along the line that a state highway was to be chosen across the state.

Three Routes Inspected

To do this he divided the towns in three different routes, the northern route, which crosses the river at St. Charles and passes through the towns of Armstrong, Huntsville, Moberly, Clark, Sturgeon, Centralia, Thompson, Mexico, Laddonia, Vandalia, Curryville, Bowling Green, Louisiana, Eolia, Troy, Flinthill, St. Peters and St. Charles; the southern route, which crosses the river at Jefferson City and passes through the towns of Hickman Mills, Lee Summett, Pleasant Hill, Strasburg, Holden, Warrensburg, Montserrat, Knobnoster, La Monte,Dresden, Sedalia, Otterville, Tipton, Clarksburg, California, Centertown, Jefferson City, Huberts Ferry, Lynn, Mt. Sterling, Drake, Union and Gray's Summit; the central route, which is the old Santa Fe trail-Boone-Lick route, crosses the river at Glasgow and passes through the following towns: Independence, Buckner, Levasey, Lexington, Confederate Home, Higginsville, Corder, Blackburn, Shackleford, Marshall, Slater, Gilliam, Glascow, Fayette, Rocheport, Midway, Columbia, Millersburg, Fulton, Williamsburg, Mineola, Danville, New Florence, High Hill, Jonesburg, Warrenton, Wright City, Foristel, Wentzville, O'Fallon, St. Peters and St. Charles.

The inspecton was divided in two parts, one known as the St. Louis party and the other as the Kansas City party, both parties inspecting parts of all three routes.

The Kansas City party left the Midland building promptly at 8:00 o'clock in charge of Curtis Hill, state highway engineer, and the St. Louis party left at the same time from St. Louis, in charge of Governor Hadley.

The roads over which the Kansas City delegation passed the first day can not be equaled in many states in the United States, and right here it should be stated that the writer concluded after going over the entire route that the Missouri roads have been badly misjudged. This may be due to the fact that every foot of the road over which the highway seekers traversed was dragged by the farmers along the line. If enthusiasm will build good roads for Missouri, Missouri bids fair to have the best roads in the United States. Every member of the board of agriculture, which will be the judge of the route selected, was surprised at the roads. And those motorists who went on the trip can talk of nothing else but Missouri's good roads!

There are many hills along the routes, but as a whole the roads which are dirt are in splendid condition.

The worst roads on the trip were found on the southern route, between Jefferson City and Sedalia. Here the country is very hilly and stony and in many cases the roads are hard to travel over.

From Kansas City to St. Louis

How many people in the United States know that many motorists make the trip from Kansas City to St. Louis in 14 hours?

The Daughters of the Revolution are interested in the central or Santa Fe-Boone-Lick trail route and three members of this organization made the trip and spoke many times along the route in favor of the route which they want selected. There is great rivalry among the different towns along the different routes for the state highway, but the best evidence that Missouri will have good roads is the fact that many counties already have appropriated many thousands of dollars to rock the road in their territory. And those who have not made an appropriation say that whether the state highway passes through their town or not they will have rock roads.

Governor Hadley said, in explaining to the people of the different towns along the route that the motorists are not the only ones that rock roads benefit.

Following is the mileage, population and number of motor cars in each town along the route taken by the Kansas City delegation:

Mileage	Town	Population	No. of motor cars
0.0	Kansas City	.....	...
8.0	Independence	3,000	25
22.5	Buckner	300	5
26.5	Levasey	50	2
39.3	Oak Grove	1,000	10
51.3	Odessa	2,500	19
71.3	Lexington	5,242	38
81.1	Higginsville	3,000	40
87.5	Corder	1,000	8
95.5	Blackburn	600	3
102.2	Mt. Leonard	300	3
113.2	Marshall	6,000	25
126.7	Slater	3,500	25
130.5	Gillham	5,000	5
141.4	Glasgow	1,700	30
151.1	Armstrong	300	2
155.1	Roanoke	100	None
166.6	Huntsville	1,500	6
173.4	Moberly	14,000	100
180.4	Huntsville	.....	...
192.8	Roanoke	.....	...
196.0	Armstrong	.....	...
206.7	Fayette	3,000	10
222.2	Rochefort	400	2
229.2	Midway	50	None
236.2	Columbia	8,000	40
248.6	Millsburg	300	2
259.8	Fulton	5,000	100
271.0	New Bloomfield	100	1
284.5	Jefferson City	12,000	40
297.4	Centertown	300	None
306.9	California	2,500	10
314.0	Clarksburg	300	1
321.8	Tipton	2,000	12
337.7	Otterville	600	1
343.4	Smithton	400	2
352.8	Sedalia	10,000	30
368.7	La Monte	900	7
377.2	Knobnoster	700	7
390.7	Warrensburg	5,000	40
397.4	Centerview	500	6
408.5	Holden	2,300	25
419.4	Strasburg	300	3
428.2	Pleasant Hill	2,600	50
445.7	Lees Summitt	1,800	32
470.5	Kansas City	.....	...

Nebraskans Keep Up Good Roads Cry

OMAHA, Neb., July 29—The southern tier of counties in Nebraska are especially interested in good roads, and in motor clubs. D. E. Watkins, secretary of the Nebraska Automobile club, made a tour through these counties last week, organizing clubs. The little town of Diller, whose 500 inhabitants have stirred up such an interest in good roads in southern Nebraska, has still got the same keen spirit. A meeting was held at Fairbury, Monday night, and fifteen cars drove the 15 miles to Fairbury from Diller. There was a large attendance at the meeting, and the club was formed with fifty-one charter members. The following officers were elected: J. W. McDonnell, Fairbury, president; L. M. Nelson, Fairbury, vice-president; W. M. Lewis, Fairbury, secretary and treasurer. A director was elected from each township in the county to oversee the roads of that township.

The meeting in Webster county also was well attended. The following were elected officers of the county organization: F. A. Good, Cowles, president; C. F. Gund, Blue Hill, vice-president; L. E. Tait, Red Cloud, secretary and treasurer.

Friday night a meeting was held at Franklin and the Franklin County Automobile Association formed. The following were elected officers: Dr. J. P. Feese, Franklin, president; Dr. J. L. Hoylman, Franklin, vice-president; J. R. Blank, Hildreth, secretary and treasurer. Efforts will be made to get every car owner in all of these counties into the clubs.

North Platte Gets Busy

North Platte, Neb., July 28.—One of the most enthusiastic good roads meetings ever held in this section of the state was in session here recently. There were representatives from towns along the North Platte route through Nebraska, as far as Sedgwick, Colo., on the west, and Kearney, on the east. The object of the meeting was to discuss the formation of a North Platte highway association, as suggested by Dan V. Stephens on the recent tour of the World-Herald special over this route. Now another bigger meeting has been called here, for August 18. One thousand invitations are being issued urging people along the route to attend this meeting. Special stationery is being printed, bearing the map of the route.

Laying Out South Platte Route

Omaha, Neb., July 29—Motorists who were officially laying out the South Platte route through Nebraska, completed the run Tuesday night after an 8-day run. They finished the trip more optimistic than ever over the possibilities of this route. At Denver they were enthusiastically received, a luncheon being tendered them by the motoring committee of the chamber of commerce. In the party were officers of the Omaha-Denver Highway Association, Professor G. R. Chatburn of the State university, representing the Lincoln Commercial Club, who lectured along the way on good roads; S. A. Searle, representing the Omaha Commercial Club, and a surveyor, photographer, and publicity man. The route was definitely laid out, and a complete route book will be published.

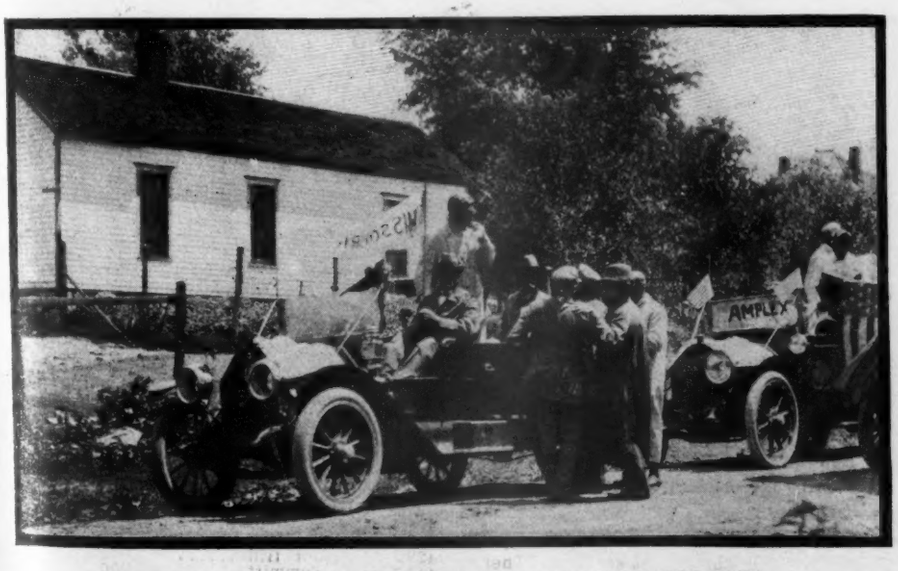
Law Held Up a Year

Vermillion, S. D., July 26—The operation of the road law passed by the last legislature will be held up in Clay county for at least a year. The law provides that in any county where 10 per cent of the voters petition for a vote on the proposition, it can not become operative until after the vote has been taken. The petition already has been filed. Under this law, the office of overseer is discontinued, the supervisors directing all highway work. All citizens between the age of 21 and 50 shall pay in cash $2 for road and poll tax purposes. If the vote favors the law, it will become effective as soon as the vote is counted. A negative vote means that road work will continue under the direction of an overseer. In case another vote is wanted, it would take a 15 per cent petition.

Demanding Better Roads

Council Bluffs, Ia., July 28—The road supervisors of Pottawattamie county were called to account by the county attorney, county commissioners and motorists recently for not improving that part of the highways leading into Council Bluffs which lie in this county. The supervisors came back with the complaint that the roads were too hard to be properly worked.

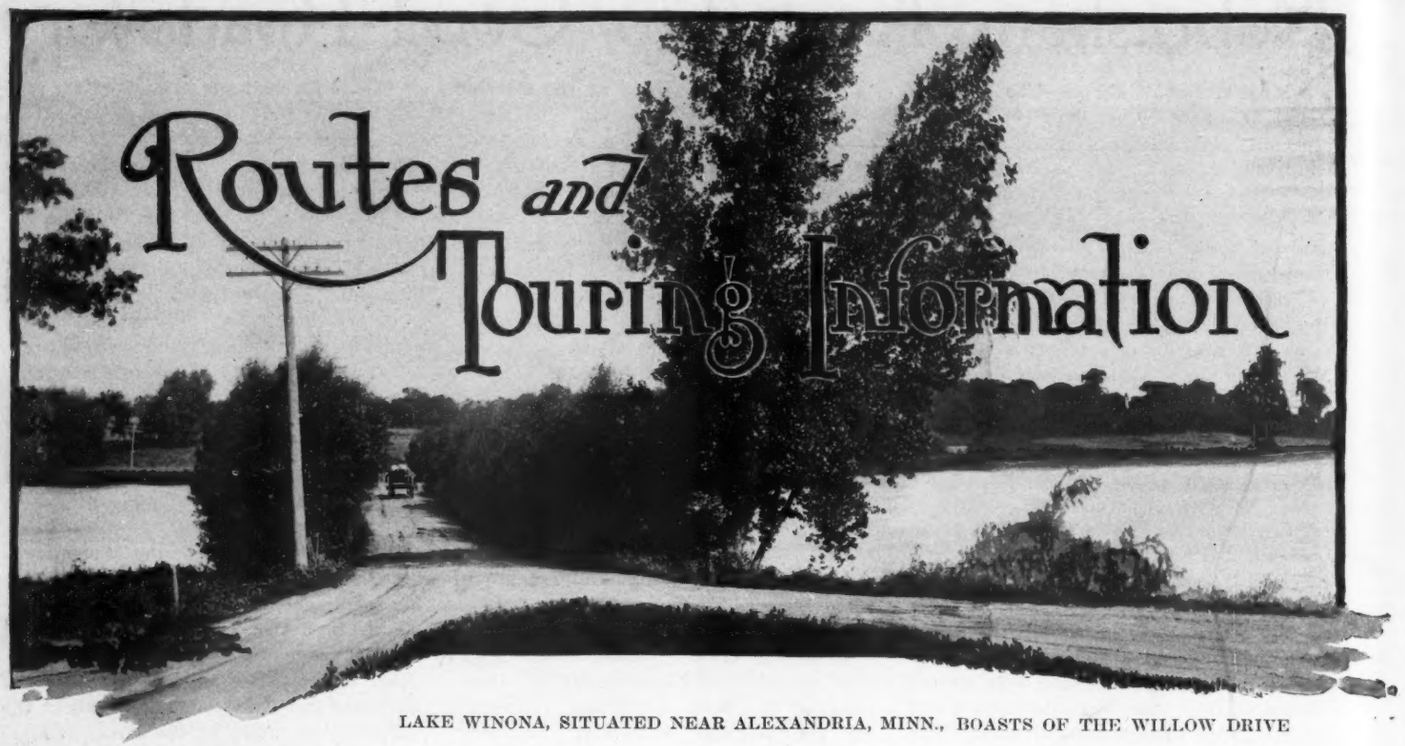
Secretary Towne of the Commercial Club, who was present, had called a meeting to reorganize the Council Bluffs Automobile Club the week before to attempt to get some work done on the roads. Other organizations in various sections of the state had been complaining about the miserable condition of the principal highways in this county. The commissioners said it was not in their power to act, as the new law provided that the road supervisors should work the roads and keep them in good condition. To settle the controversy the road men invited the motorists to meet them on a farm near the city, for a demonstration. The motorists are expected to bring shovels and take a turn at working the road.



GOVERNOR HADLEY OF MISSOURI ON ROAD-INSPECTION TOUR

MANY IN TRUCK CONTEST

Chicago, Aug. 2—Forty-four entries have been made for the Chicago American's motor truck contest which starts next Tuesday and continues to August 17. The night stops are South Bend, Fort Wayne, Lima, Toledo, Detroit, Jackson, Kalamazoo, South Bend and Chicago. The entires take in everything from 500 pounds up to and including 5-ton trucks. The entries are: Gramm Motor Car Co., four; Modern Motor Car Co., one; Hewitt Motor Truck Co., one; Grabowsky Power Wagon Co., two; Pass Motor Co., one; Buick Motor Car Co., two; McIntyre Motor Truck Co., one; Dayton Auto Truck Co., one; Speedwell Motor Car Co., one; Kelly Motor Truck Co., four; International Motor Car Co., two; South-Juergens Co., two; Rapid Motor Vehicle Co., one; Buffalo, one; Nelson Le Moon, one; Lincoln Motor Car Works, one; Alco, two; Krickworth Motor Wagon Co., one; Chicago Motor Wagon Co., one; Mais Motor Truck Co., one; Owosso Motor Co., one; Chicago Pneumatic Tool Co., one; Federal Motor Truck Co., one; Chase Motor Car Co., two; Harder fire truck, non-contestant); Stephenson Motor Truck Co., two; Van Dyke Motor Car Co., one; Clark Power Wagon Co., two; Knox, one; Maytag Mason Motor Co., two.



LAKE WINONA, SITUATED NEAR ALEXANDRIA, MINN., BOASTS OF THE WILLOW DRIVE

COLORADO TO NEW YORK

Colorado, Texas—Editor Motor Age—Kindly give me a route from Colorado, Texas, to Selma, Ala., thence to New York city.—C. M. Adams.

Leaving Colorado, Tex., follow the southern transcontinental route to Birmingham, Ala., as laid out by the Ohio pathfinder, going through Loraine, Roscoe, Sweetwater, Trent, Merkel, Abilene, Albany Station, Breckenridge, Palo Pinto, Mineral Wells, Weatherford, Annetta, Aledo, Ben Brook, Fort Worth, Hadley, Arlington, Grand Prairie, Dallas, Richardson, Plano, McKinney, Melissa, Anna, Sadalia, Pilot Grove, Whitewright, Ely, Bonham, Dodds, Windom, Honey Grove, Petty, Hightown, Brookston, Paris, Blossom, Detroit, Clarkville, Annona, DeKalb, Boston, New Boston, Hooks, Leary, Texarkana, Mandeville, Homan, Fulton, Hope, Emmet, Prescott, Boughton, Beirne, Okolona, Dobyville, Arkadelphia, Friendship, Social Hill, Lawrence, Hot Springs, Benton, Collegeville, Little Rock. From Little Rock to Memphis go through Lonoke, Carlisle, Hazen, Stuttgart, Roe, Clarendon, Marvel, Barton, Belser, Helena, Tunica, Hollywood, Clack, Lake Cormorant, Glover, Walls, Lynchburg, Memphis. Leaving Memphis pass through Aulon, Germantown, Forest Hill, Rossville, Moscow, Grand Junction, Saulsbury, Rogers Springs, Corinth, Burnsville, Cherokee, Barton, Tuscumbia, Leighton, Town Creek, Courtland, Wheeler, Hillsboro, Trinity, Decatur, Hartselles, Berlin, Blountsville, Tidwell, Compton, Village Springs, Birmingham.

According to information given out by the Alabama Automobile Association leave Birmingham via Twentieth street to Eleventh avenue, then hit the Columbian road and go over Shady mountain to Monte Valor, thence to Clinton, Verbena, Wetumpka, cross the ferry at Wetumpka and go into Montgomery via the Pickett Springs road. In case there is a rainy spell it would be advisable for you to inquire at Verbena as to the condition of the roads from there to Montgomery. If muddy, leave Verbena for Montgomery via Deitsville. From Montgomery to Selma, 50 miles, go to Stone, thence through Manack, Burksville, Lownsboro Station, White Hall, Benton, Selma. The roads from Montgomery to Selma are in excellent condition.

Leaving Selma for New York city, return to Montgomery, thence through Mount Meigs, Tuskegee, Auburn, Opelika, Beulah, Glass, Langdale, La Grange, Hogansville, Grantville, St. Charles, Moreland, Newman, Ga., McCollon, Palmetto, East College Point, Atlanta.

From Atlanta to Gettysburg follow what is called the National Highway, going through Decatur, Ingleside, Scottdale, Stone Mountain, Snellville, Lawrenceville, Auburn, Winder, Commerce, Franklin, Royston, Canon, Lavonia, Anderson, Piedmont, Oak Grove, Greenville, Greer, Duncan, Spartanburg, Converse, Gafney,

PICTURESQUE DRIVEWAY WHICH ENTICES THE MOTORISTS AT LAKE LAKOTA, MINN

Blacksburg, S. C., Grover, N. C., Kings Mountain, Bessemer City, Gastonia, Lowell, Belmont, Sloane's Ferry, Charlotte. Charlotte to Winston-Salem is over a rolling country through Newell, Concord, Kanapolis, China Grove, Salisbury, Spencer, Lexington, Thomasville, High Point, Jamestown, Greensboro, Guilford Battlegrounds, Summerfield, Kernersville, Winston-Salem. Leaving Winston-Salem for Roanoke you will have to ford many small fords. The first 25 miles is over rolling country and the remainder very hilly and steep grades. The towns are: Winston-Salem, Centerville, Kernersville, Stokesboro, Ellisboro, Madison, Stoneville, Ridgeway, Martinsville, Oak Level, Syndorville, Rocky Mount, Roanoke, Continuing to Staunton, Va., go through Boonsac, Cloverdale, Troutville, Buchanan, Natural Bridge, Fancy Hill, Lexington, Timber Ridge, Fairfield, Greenville, Minte Springs, Staunton. Going from Staunton to Hagerstown, Md., there will be a toll of 15 cents at each of nineteen toll gates. and it is necessary, according to the Blue Book route book to register name, residence and license number with each gatekeeper. The towns are: Staunton, Burkstown, Mount Crawford, Harrisonburg, Lacy Springs, New Market, Mount Jackson, Edinburg, Woodstock, Maurertown, Strassburg, Middletown, Stephen City, Winchester, Martinsburg, W. Va., Berkeley, Falling Waters, Williamsport, Md., Hagerstown.

Hagerstown to Gettysburg is over stone road practically all the way, with toll amounting to 68 cents; go through Waynesboro, Rouzerville, Fairfield, Gettysburg.

Gettysburg-Philadelphia. Toll for runabout $1.88 to $2.10. Gettysburg, New Oxford, Abbottstown, York, Wrightsville, Columbia, Lancaster, Coatesville, Downington, Paoli, Devon, Wayne, Bryn Mawr, Ardmore, Philadelphia.

Philadelphia to Trenton, N. J., is over macadam road most of the way, toll 27 cents. Go through Ogontz, Bustleton, La Trappe, Langhorne, Glen Lake Station, Trenton, N. J. Leaving Trenton go to New York through Lawrenceville, Princeton, Kingston, New Brunswick, Metuchen, Menlo Park, Eselin Station, Elizabeth, Newark, New York.

For complete running directions, garage facilities, etc., you are referred to the Blue Book, volume 3, 1911 edition, which covers this entire route. See map on page 19 for additional information.

DALLAS, S. D., TO PHOENIX

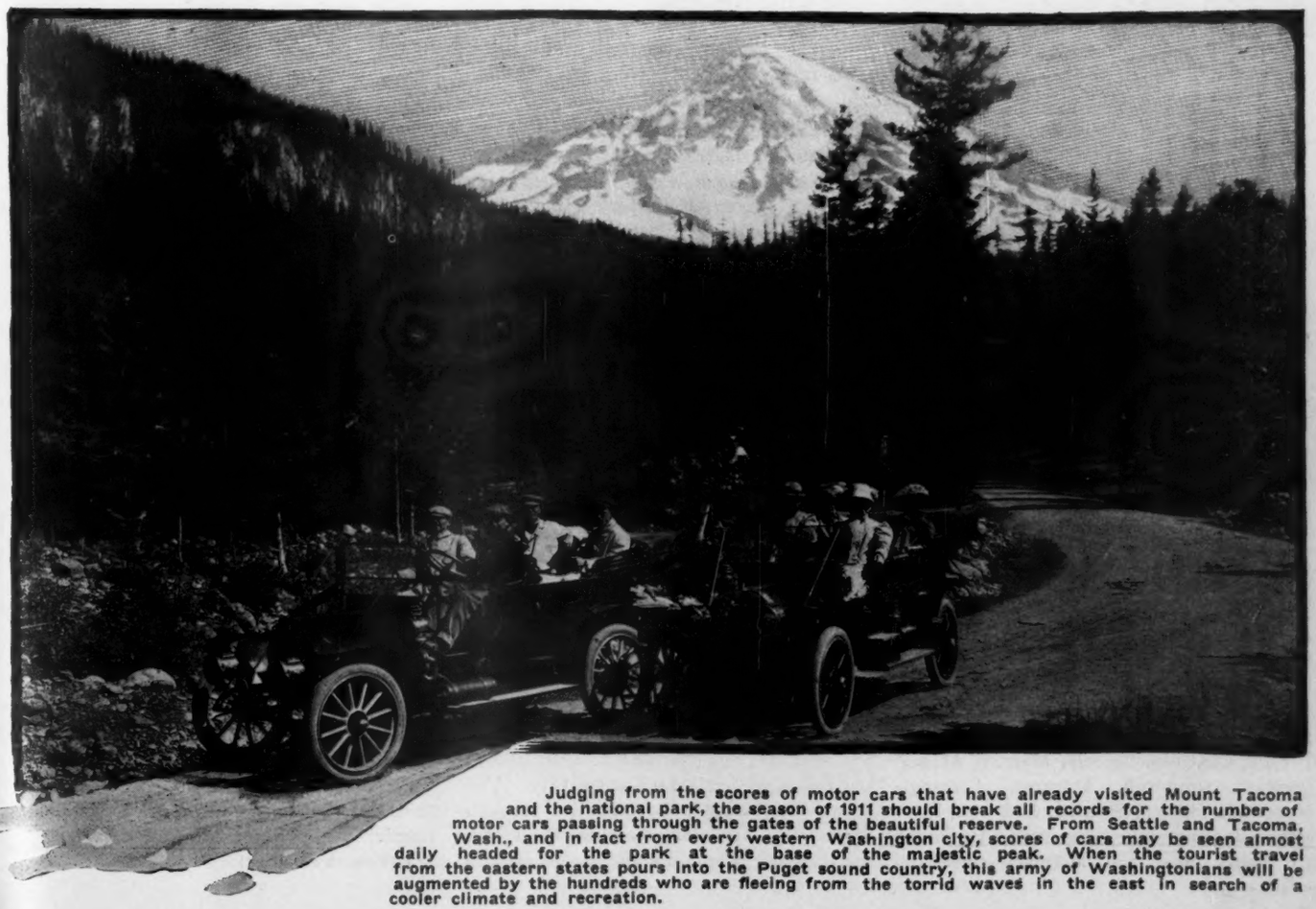
Dallas, S. D.—Editor Motor Age—Several friends are planning a trip from here to Phoenix, Ariz., this fall. Will Motor Age tell me the best route, as the guide books I have do not give routes except in the middle west?—A Reader.

From Dallas, S. D., Motor Age suggests that a direct route would be to go by the way of Burke, Herrick, S. D., and Butte, Rosedale, Lynch, Verdigris, Creighton, Brunswick, Neligh, Elgin, Albion, Fullerton, Central City, Neb. From here follow the official transcontinental route to Julesberg, Colo., going through Chapman, Grand Island, Wood River, Shelton, Gibbon, Kearney, Elm Creek, Lexington, Cozad, Gothenburg, North Platte, Paxton, Ogallala, Julesburg.

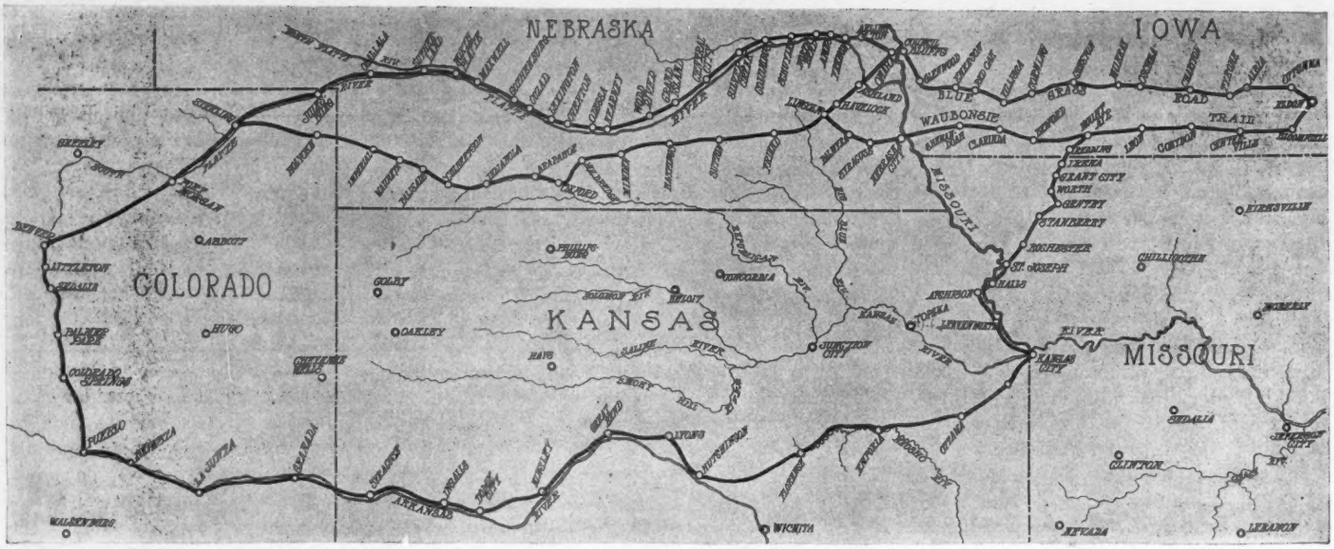
From Julesburg to Denver you have the choice of two routes: Continue west to Cheyenne, Wyo., thence south to Wellington and Fort Collins, Loveland, Berthoud, Longmont, to Denver. The second choice is via Fort Morgan, from Julesburg, passing through Ovid, Sedgwick, Red Lion, Crook, Proctor, Iliff, Ford, Sterling, Atwood, Merino, Hillrose, Brush, Fort Morgan, Moreville, Watkins, Sable, Denver.

From Denver south to Santa Fe the route lies through Petersburg, Littleton, Acegua, Sedalia, Castle Rock, Perry Park, Palmer Lake, Monument, Pring, Breed, Pike View, Colorado Springs, Leander, Kelker, Skinner's, Crews, Fountain, Buttes, Buttes No. 2, Henkel, Pinon, Bragdon, Eden, Pueblo. Distance approximately 114 miles over sand and clay mix-

Mount Tacoma Attractive to Pacific Coast Motorists



Judging from the scores of motor cars that have already visited Mount Tacoma and the national park, the season of 1911 should break all records for the number of motor cars passing through the gates of the beautiful reserve. From Seattle and Tacoma, Wash., and in fact from every western Washington city, scores of cars may be seen almost daily headed for the park at the base of the majestic peak. When the tourist travel from the eastern states pours into the Puget sound country, this army of Washingtonians will be augmented by the hundreds who are fleeing from the torrid waves in the east in search of a cooler climate and recreation.



CHOICE OF ROADS OFFERED TO THE MOTORIST FROM ELDON, IA., TO DENVER, COLO.

tures to Colorado Springs, and very good roads, with some adobe and sand, the balance of the route to Peublo. From Pueblo to Santa Fe, distance approximately 315 miles, pass through San Carlos, Verde, Salt Creek, Larimer, Huerfano, Apache, Cuchara Junction, Walsenburg, Winchell, Main, Monson, Bunker Hill, Rugby, Lynn, Acme, Ludlow, Suffield, Bowen, Trinidad, Starkville, Raton, Maxwell City, French, Springer, Calmore, Wagon Mound, Tipton, Watrous, Los Vegas, Tecolate, Blanchard, San Jose, Pagareto, Glorieta, Santa Fe. Motor Age suggests that while in Denver you call at the headquarters of the Denver Motor Club and secure specific road directions over this route, as the portion of the trip from Pueblo to Santa Fe is a most difficult one and will be fraught with many difficulties at the best. Undoubtedly, the wisest course to pursue is to secure the services of a guide over the Raton mountains from Trinidad and also beyond Raton.

From Santa Fe, N. M., to Phoenix, Ariz., the motorist has the choice of two routes: One going through Albuquerque, then following the Santa Fe railroad to Prescott, then Phoenix. The other takes the tourist south along the Rio Grande river to San Marcial, N. M., thence to Rincon, Silver City, Lordsburg, Wilcox, Benson, Florence, and Phoenix.

IOWA TO DENVER ROADS

Eldon, Ia.—Editor Motor Age—I intend starting in a short time to Denver, wishing to go through Omaha and returning through Kansas City, and would like some advice on a route that would cover that territory.—K. C. Finney.

From Eldon motor to Ottumwa, where you strike the Blue Grass road, and continue on it to Council Bluffs through Albia, Tyrone, Chariton, Osceola, Murray, Afton, Creston, Cromwell, Prescott, Corning, Nodaway, Villisca, Stanton, Red Oak, Emerson, Hastings and Glenwood. At Council Bluffs cross the Missouri river to Omaha, Neb., thence to Denver over the northern route through Nebraska, which passes through Elkhorn, Fremont, Schuyler, Columbus, Silver Creek, Clarks, Chapman, Alda, Shelton, Kearney, Elm Creek, Lexington, Willow Island, Gothenburg, North Platte, Paxton, Brule, Julesburg, Sedgwick, Crook, Powell, Sterling, Merino, Hillrose, Fort Morgan, Moreville, Bennett, Watkins and Sable. The southern route through Nebraska from Omaha to Denver takes you through Millard, Ashland, Greenwood, Waverly, Havelock, Lincoln, Friend, Sutton, Hastings, Minden, Holdrege, Atlanta, Oxford, Arapahoe, Cambridge, Indianola, McCook, Culbertson, Palisade, Wauneta, Imperial, Lamar, Holyoke, and Sterling.

A southern route through Iowa called the Waubonsie trail can be traversed by motoring to Bloomfield, Centerville, Plano, Corydon, Leon, Kellerton, Mount Ayr, Conway, Bedford, Clarinda, Shenandoah, and Sidney to Nebraska City, where the southern Nebraska road starts which you will follow on to Lincoln through Dunbar, Unadilla, Palmyra, and Eagle and the rest of the way to Denver as outlined above.

While in Denver a short side trip would be to Estes Park through Lafayette, Longmont, Berthoud, Loveland, Woldes, Loveland Canyon, Waltonia or over a short cut from Longmont through Hygiene and Lyons. You might motor to Uneva lake through Littleton, Conifer, Baileys, Cassells, Como, Borea and Breckenridge. It is a 27-mile drive to Crags; a trip to Lookout park will take you 22 miles out of Denver, or you might motor to the Royal gorge, to Boulder, to Idaho Springs or to Shawnee Lodge.

The return trip can be made by going to Colorado Springs and traveling over the Santa Fe trail to Kansas City. The stretch to Colorado Springs lies through Petersburg, Littleton, Acequia, Gann, Sedalia, Perry Park, Palmer Lake, Monument, Pring, Breed and Pikeview. Now over the Santa Fe trail you will pass through Fountain, Eden, Pueblo, Nepesta, La Junta, Las Animas, Lamar, Grenada, Coolidge, Syracuse, Kendall, Lakin, Garden City, Charleston, Howells, Dodge City, Offerle, Larned, Great Bend, Lyons, Sterling, Hutchinson, Newton, Florence, Elmdale, Emporia, Agricola, Ottawa, Edgerton, Olathe, and Martin City to Kansas City.

From Kansas City motor through Piper, Wallula, Lansing, Leavenworth, Lowemont, Atchison, Rushville, and Halls to St. Joseph, Mo., where you strike the Ayr line route and travel over this road through Rochester, Stanberry, Gentry, Worth, Grant City, Irena, Reddings, Delphos and Mount Ayr, where you connect with the Waubonsie trail and travel home in the reverse direction from that which is given in the second paragraph.

ILLINOIS TO PENNSYLVANIA

Lanark, Ill.—Editor Motor Age—Through the Routes and Touring Information department will Motor Age give me the best route from Lanark, Ill., to Chambersburg, Pa.?—D. C. Pfoutz.

A Blue Book routing covering the points named is as follows: From Lanark go to Freeport, thence to Rockford, Ill. Continuing east you will pass through Cherry Valley, Belvidere, Garden Prairie, Marengo, Elgin, Ontarioville, Addison, Chicago.

With South Bend, Ind., your next objective point, 101.6 miles, go through South Chicago, Hammond, Highlands, Hobart, Valparaiso, Westville, La Porte, New Carlisle, South Bend. Leaving South Bend for Toledo, 166 miles, the towns are Mishawaka, Goshen, Ligonier, Kendallville, Butler, Bryan, Archbold, Wauseon, Delta, Swanton, Caraghar, Toledo. Toledo to Cleveland, 120 miles, through Fremont, Castalia, Sandusky, Huron, Vermillion, Lorain, Rocky River Viaduct, Cleveland.

The most satisfactory route from Cleve-

land to Pittsburg, 129 miles, takes you through Bedford, Twinsburg, Streetsboro, Ravenna, Deerfield, North Benton, Salem, Columbiana, Unity, O., Darlington, Pa., Beaver Falls, New Brighton, Rochester, Freedom, Economy, Sewickley, Pittsburg. You will find the roads in Pennsylvania winding and hilly, while those in Ohio are sandy and considerable clay; however, the route outlined is the shortest and the best available.

Leaving Pittsburg for Bedford Springs, go through Wilkinsburg, Monroeville, Murhysville, Newlonsburg, Export, Delmont, Salemville, New Alexandria, Blairsville, Armagh, Cramer, Cambria City, Johnstown, Geistown, Winber, Felix, Pleasantville, Spring Meadow, Bedford Springs. Bedford Springs to Chambersburg, Pa., 57 miles, is through Mount Dallas, Everett, Breezewood, Reamers, Harrisonville, Fort Loudon, Saint Thomas, Chambersburg.

ILLINOIS TO NORTH DAKOTA

Hanna City, Ill.—Editor Motor Age: I expect to take a trip overland to Portal, N. D., and wish to go by way of St. Paul. —W. A. Siegel.

Motor to Farmington, thence to Davenport, Ia., through Maquon, Knoxville, Galesburg, Henderson, Alpha, New Windsor and Rock Island. You will travel on the river-to-river road as far as Newton, through Walcott, Durant, Wilton, Moscow, W. Liberty, Iowa City, Tiffin, Oxford, Homestead, S. Amana, Marengo, Ladora, Victor, Brooklyn and Grinnell. The road now lies directly north to St. Paul, through Marshalltown, Albion, Eldora, Iowa Falls, Hampton, Rockwell, Mason City, Kensett, Northwood, Glenville, Albert Lea, Geneva, Owatonna, Milford, Faribault, Dundas, Northfield, Farmington, Rosemont and St. Paul.

The route to St. Cloud can be followed through Robinsdale, Osseo, Anoka, Elk River, Big Lake, Becker, and Clear Lake. From St. Cloud pass on to St. Joseph, Cold Springs, Torah, St. Martins, New Munich, Melrose, Sauk Center, Villard and Alexandria, a distance of 101 miles. The route from Torah to Melrose is one of the finest drives in this country, but a more direct one would be from St. Joseph to Avon, Albany, Freeport and Melrose. From Sauk Center another way is to West Union and Osakis, which takes you into the hills. Alexandria is situated in the lake region where bass, wall-eyed and great northern pike abound. The roads in this part of the country are fine and lead around through beautiful woods and skirt many of the lakes. From Alexandria to Fargo, N. D., is 131 miles through Garfield, Brandon, Evansville, Ashby, Dalton, Fergus Falls, Elizabeth, Pelican Rapids, Rollag, Hawley and Moorhead. A more direct route from Fergus Falls via Barnesville is over the black gumbo soil and impassable in or after wet weather, while the route via Pelican Rapids is rather sandy.

The Fargo-Grand Forks stretch is through Georgetown, Hendrum, Halstad, Shelly, Climax, Belmont, Reynolds, and Thompson. It is rather bad going around the Devils Lake region, but the route lies through Ojata, Emerado, Arvilla, Larimore, McCanna, Niagara, Petersburg, Michigan, Mapes, Lakota, Bartlett, Crary, Devils Lake, Penn, Leeds, Knox, Fero, Rugby, Turnbridge, Towner, Dunbeigh, Granville, Surrey and Minot. Portal is a short distance north of Minot.

Another route from St. Paul via Aberdeen, N. D., will take you through Wayzata, Long Lake, Maple Plain, Montrose, Waverly, Dassel, Litchfield, Atwater, Willmar, Murdock, Benson, Appleton, Ortonville, Millbank, Summit, Waubay, Webster, Holmquist, Andover, Jamestown, Aberdeen, thence follow the railroad in a general way through Oakes, Jamestown, Oberon, Leeds, Towner, Granville and Minot, or from Aberdeen go 40 miles almost directly north over an excellent prairie road to Ellendale, Duane, Monango, thence Edgeley and Jamestown, following the railroad as closely as possible.

EASTERN LICENSE REGULATIONS

I am contemplating a tour next month and want some information in regard to license required by the different states.

1—Charlotte, N. C., to Atlantic City, N. J., via the National highway.

2—Charlotte, N. C. to Savannah, Ga.—Brooke B. Todd.

1—As North Carolina extends reciprocity to non-residents, you are therefore exempt in Virginia for two periods of 7 consecutive days but must display your own state license tag. In Maryland non-residents must apply to the commissioner of motor vehicles, 508 Union Trust building, Baltimore, Md., for a non-resident's 7-day permit tag. Two of these can be had each year, for which no charge is made. In Delaware and Pennsylvania you are exempt but must display your own state tag. In New Jersey non-residents must apply to the commissioner of motor vehicles, Trenton, N. J., for a non-resident's 8-day license, or four periods of 2-days each during one year, for which a charge of $1 is made.

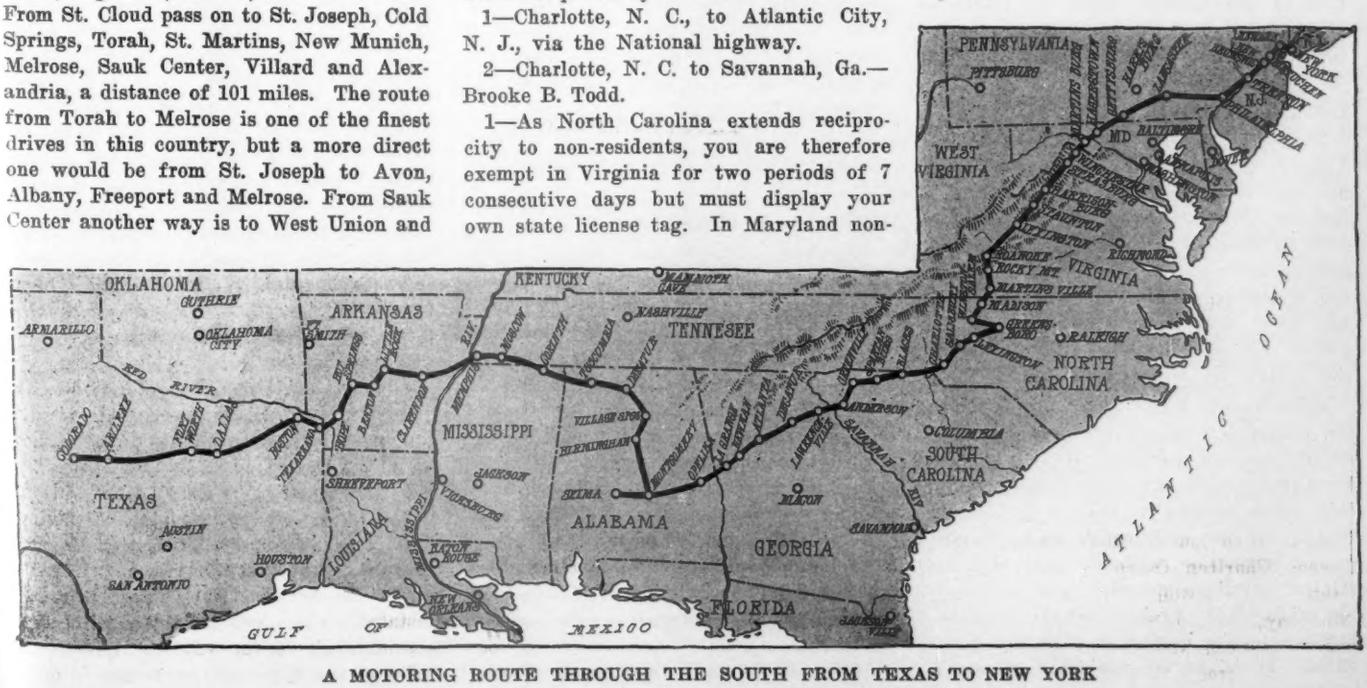
2—You are exempt in the states of North Carolina and Georgia, if you have complied with your home state laws regarding registration.

MEMPHIS TO SPARTANBURG, S. C.

Little Rock, Ark.—Editor Motor Age—We contemplate making a trip in a White gasoline car from Memphis, Tenn., to Atlanta, Ga., by the way of Chattanooga or Birmingham, Ala. Also from Atlanta, Ga., to Spartanburg, S. C. If Motor Age can give us this route information at once we will appreciate it very much, as we plan on leaving in about a week or ten days.—E. Polk.

Memphis to Atlanta, Ga., and Spartenburg, S. C., lies through Moscow, Corinth, Tuscombia, Decatur, Village Springs, Birmingham Montgomery, Opelika, La Grange, Newman, Atlanta, Decatur, Lawrenceville, Anderson and Greenville. You will find a map covering this stretch below and the itinerary outlined more specifically in the communication from Colorad, Texas.

Should you desire to motor to Chattanooga from Memphis leave the route at Decatur and go to Huntsville, Mayfield, Paint Rock, Woodville, Larkinsville, Scottsboro, Fackler, Bridgeport, Jasper and Rankin's Ferry. Atlanta to Chattanooga lies through Marietta, Kennesaw, Cartersville, Rome, Summerville and Lafayette.



A MOTORING ROUTE THROUGH THE SOUTH FROM TEXAS TO NEW YORK

The Readers

EDITOR'S NOTE—To the Readers of the Clearing House columns: Motor Age insists on having bona fide signatures to all communications published in this department. It has been discovered that the proper signature has not been given on many communications, and Motor Age will not publish such communications, and will take steps to hunt down the offenders of this rule if it is violated.

DURYEA'S TWO-CYCLE VIEWS

READING, PA.—Editor Motor Age—I think the Roberts two-cycle formula which Motor Age gives in the issue of June 22 in reply to X is rather too low for present day two-cycle results. I am sure makers of two-cycle engines are getting better results in motor practice than the formula indicates and would suggest that 10,000 or 11,000 be used as a devisor. The formula would then be

$$\text{Horsepower} = \frac{D^2 \times L \times R \times N}{11{,}000}$$

While many two-cycle engines will not give a higher maximum power, they are nearly all good pullers at medium speeds and this fact should be kept in mind in applying the formula. The improvements have come from better constructions, such as lighter valves, improved deflectors, better transfer passages, better port arrangements and better ignition. Carbureters have also been much improved.—Charles E. Duryea.

LOOK AT THE TIMER

Washington, D. C.—Editor Motor Age—I have a Pope-Toledo car. What can I do to a motor that will not start at once after it gets heated? I have to wait for it to cool before the motor will start.—E. S. Wilcox.

It seems from what you write that the motor starts easier when cool than when warm. This makes your case rather an unusual one. It is quite likely, however, that owing to a possible slipping of the timer segment your ignition is considerably later than it should be, with the result that your motor not only is hard to start either when cold or when warm, but the overheating is brought about by the same cause. The revolving segment of your timer should be set so the spark occurs in the cylinder when the piston is about ¼ of an inch down on the explosion stroke and the spark lever fully retarded.

OIL OR COOLING

Maysville, N. Dak.—Editor Motor Age—Through the Readers' Clearing House tell me what is the matter with my engine, a Detroit stationary two-cycle. When it is cool it works nicely and has plenty of power, but when it gets warm it is just the opposite. It also runs unevenly. It has been taken apart, cleaned, and repaired, but it is not improved. What is the cause, and remedy?—A Reader.

Your trouble seems to be due either to the use of too light a grade of lubricant or to improper cooling. If the oil you are using is such that it becomes extremely thin when subject to heat it is possible that it has not sufficient body to furnish proper lubrication, with the result that the fricion becomes excessive and overheating takes place. Perhaps the oil is not being fed to the engine in sufficient quantities. It might be advisable to try a slightly heavier and better grade of oil. Should there be an obstruction either in the water piping or incrustations in the radiator or perhaps an excess of sediment in the waterjackets of your motor, overheating would be brought about with the consequent loss of power when the engine has become warmed up. It also is possible that you are using too rich a mixture, which is another primary cause for overheating and consequent loss of power.

DRAINING MARION CRANKCASE

Chicago—Editor Motor Age—Will Motor Age kindly answer the following questions through the Readers' Clearing House?

1—Please explain, and if possible give a diagram, showing how to drain a 1910 Marion model 10 crankcase.

2—Give a rough estimate of how much a motor cycle could be rented for, if the renter paid all expenses.—F. M. Sherlan.

1—There is a little petcock centrally located underneath the Marion motor,

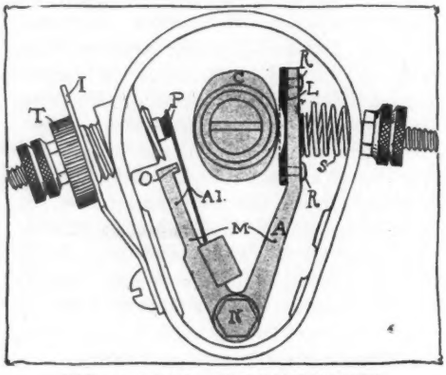


FIG. 1—REMY CIRCUIT-BREAKER

which is most readily reached by stretching the arm down just behind the magneto. This petcock is for the purpose of draining the motor crankcase. Should it be stopped up a little wire may be worked through it to clean it out.

2—Motor Age has been unable to learn of any concerns making it a business, or even willing to rent motor cycles.

THE S. A. E. FORMULA

Galesburg, Ill.—Editor Motor Age—Through the Readers' Clearing House will Motor Age answer the following questions:

1—What is the bore and stroke of the Blitzen Benz? What is the price of the regular Benz car?

2—What is the A. L. A. M. formula for rating horsepower, and why does it not allow anything on the stroke?

3—What is meant by sweepstake races?—George Applegreen.

1—The bore and stroke of the Blitzen Benz is 7.2835 and 7.8741 respectively. The price of the 30-horsepower Benz chassis is $4,250, and the 50-horsepower chassis sells for $6,250.

2—The A. L. A. M. formula which now is the S. A. E. formula, all A. L. A. M. papers, etc., having been turned over to the Society of Automobile Engineers, is

$$\frac{D^2 N}{2.5} = \text{horsepower}$$

In this formula D represents the diameter of the cylinders in inches, N the number of cylinders, and 2.5 is a constant based on a piston speed of 1,000 feet per minute. The A. L. A. M. formula does take the length of stroke into consideratiot in that it is based on a piston speed of 1,000 feet. It is not to be understood, however, that the formula was ever intended to be an absolutely correct one, but rather an easy method and approximately accurate one for computing the horsepower of motors in which a medium stroke predominates. The A. L. A. M. formula has proven particularly valuable in the past, but within the last year or two since the greater tendency towards long stroke has arisen, the shortcomings of the formula have become more and more apparent.

3—Sweepstakes races are events in which the whole money or other things staked go to the winner of the race; a given sum or prize being put up for each entrant, all of which goes to the winner or is divided among several, as may be previously agreed.

THE LOCOMOBILE STEAMER

St. Louis, Mo.—Editor Motor Age—I have an old Locomobile steam power plant on which I would like some information:

Just how low should the burner set below the boiler? It takes about an hour to bring cold water to boil, and another to bring it to 240 pounds steam pressure. The piping seems to be open, as I had the city pressure on them and forced all the dirt out. The boiler is clean, as I just put in 100 new tubes. I also would like to put a superheater on to give the best advantage. I would like to know at what pressure steam vulcanizers work. Some say they will not burn the rubber.—Wm. Ehser.

Two types of burners were used with the old Locomobile steam power plants, some of which were arranged 2½ inches below the boiler and the others 3½ inches from the tip of the burner to the bottom of the boiler. Your trouble in making steam evidently is due either to a lack of pressure on the gasoline or want of cleaning in the burner. The burner must be thoroughly clean, so that the gasoline can flow through it in sufficient quantities. See that the flame of the burner is of a blue color and not white. It would perhaps

Clearing House

EDITOR'S NOTE—In this department Motor Age answers free of charge questions regarding motor problems, and invites the discussion of pertinent subjects. Correspondence is solicited from subscribers and others. All communications must be properly signed, and should the writer not wish his name to appear, he may use any nom de plume desired.

be more practical to use a flash boiler than a superheater.

The steam pressure used in tire vulcanizers varies with the grade or kind of rubber used. One concern, for instance, will use 60 pounds pressure for various lengtbs of time, from 15 to 40 minutes; whereas another concern will use 40 pounds pressure for 40 minutes for one grade of work, and 50 pounds pressure for 50 minutes for another grade of work. Though it is possible that there are vulcanizers that will not burn the work, almost any vulcanizer will spoil the work by vulcanizing it too hard, either by having the pressure too high or leaving the work in the vulcanizer for too great a length of time.

LOOK FOR LEAKING VALVES

Lawrenceburg, Ind.—Editor Motor Age —Kindly answer through the Readers' Clearing House: A Buick 33, which has run perfectly until 2 weeks ago, suddenly developed a distinct knock which seems to be in the front half of the motor The knock occurs only when the motor is running idle or pulling lightly with the switch set on the magneto; if the switch is turned to the battery the knock immediately ceases. A Splitdorf magneto is used. The writer has a No. 10 Buick equipped with a Remy magneto which operates perfectly until the car is driven very slowly in high speed, when the motor skips, causing a very unpleasant jerk and sound in the driving members. Can this be overcome? Will it injure the magneto or cause the dry cells to soon become exhausted, if one runs much on the battery? Have recently installed the magneto, therefore the above questions.—Bonard Dam.

Your trouble most probably is due to misfiring caused by leaking valves in one of the forward cylinders. This evidently is also the cause of the trouble with your model 10 car. It is well to run as little as possible on the dry cells, for not only is it exhaustive to the cells, but quite injurious to the platinum points of the magneto circuit-breaker, which is employed to interrupt the primary currents both from the battery and magneto. By running continually on the dry cells the platinum is burnt and pitted very much faster than when running on the magneto. It is quite probable that the platinum points of your magneto have already become sufficiently pitted or burnt away to require renewal or at least dressing down.

Turn the crankshaft over slowly by hand to test the compression, and if some of the cylinders have weaker compression than the others, have their valves ground. After the valves are ground and the motor has been run a little, test the compression again; if it happens that the compression is still poor in some of the cylinders, and if you are satisfied that there is sufficient clearance between the valve-stems and pushrods, you may suspect the piston rings.

Give the cylinders a generous dose, half a cupful each, of kerosene or some other carbon-remover, and let it seep down past the rings over night. In the morning turn the motor over rapidly a few times or run

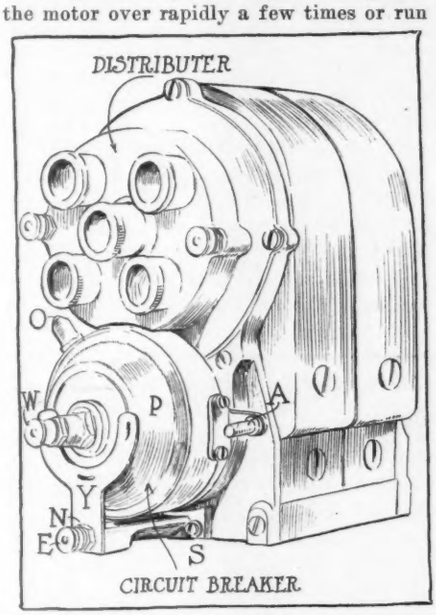


FIG. 2—THE SPLITDORF MAGNETO

it for a minute or so, then drain the oil from the crankcase and replace it with fresh, clean oil. If this treatment does not bring about a vast improvement, new rings may have to be fitted. It is possible that the trouble is caused by water in the carbureter. This may be removed by draining the float-chamber and allowing about half a teacupful of gasoline to run out.

It also is quite likely that a little adjustment of the magneto is necesary; the contact points of the circuit-breaker may not be separating sufficiently, or the plate L, Fig. 1, may be badly worn. The circuit-breaker as illustrated consists of a V-shaped piece of metal M, between the arms of which turns the cam C on the end of the armature-shaft. This cam is elliptical in shape and the wider extremities strike against one of the arms A of the V, throwing it sideways, thereby breaking contact between the points P on the opposite arm A1, and the threaded screw passing through the metal box. Where the armature cam strikes upon the arm A is fixed a metal plate L. When this becomes worn the points P on the other side, owing to the depression from wear, will not be opened sufficiently, causing the engine to misfire at low speed. This, generally, can be remedied by pressing in and releasing the clip I and screwing the adjusting screw T outward. If the wear of the plate is too great to be so corrected a new plate must be fitted. The V-shaped part of the magneto may be taken off by removing the nut or stud N; and the plate L then can be readily removed by cutting off the heads of the two copper rivets R with which it is secured to the arm. A new plate and rivets, or new platinum points may be obtained from the factory or a local agent at a reasonable cost.

As for the Splitdorf magneto, the first thing to do, after examining the plugs to see that they are clean and their points all equally distant apart, is to take hold of all the terminals or wire connections, and try to wiggle them to see if any of them are loose. If any loose ones are found they should be tightened and the motor started to see if the trouble is eliminated. If in good order, loosen the thumb-nut E and the nue N, Fig, 2, and swing the yoke or blade-spring Y downward and clear of the plate P; then remove the plate. This will expose the circuit-breaker mechanism and permit of its inspection. A more thorough investigation may be made of this feature if it next is removed from the magneto. To do this remove the control rod from the arm A and draw the circuit-breaker box away from the magneto. If it does not come off readily do not try to force it; shake it a little, and if it seems to catch, try to find out what prevents its removal; perhaps one of the lower corners of the yoke Y is sticking up in front of it, or perhaps you have forgotten to disconnect the control-rod from the arm A. Always handle a delicate mechanism gently. Fig. 3 shows how the circuit-breaker mechanism will appear when removed and it is now ready for inspection as follows: Lift the lever A and examine the contact surfaces of the contact-points P and P1, if these platinum points are not burnt off or pitted and make good contact, pass on to the roller R, which should move freely but should not be worn or loose on the pin I.

If these things are in good shape and everything else in good order the circuit-breaker can be reassembled into place and the motor turned over slowly by another person, while the operation of the parts is being scrutinized. The platinum points should separate about 1-32-inch, if they do not, loosen the lock-nuts L and L1 and then adjust for the proper space by applying a wrench to the head H of the screw. Should the platinum points be burnt or pitted so badly that they cannot be properly trimmed with a fine, smooth file, and if you are not a mechanic, or at least properly equipped with tools, send the circuit-breaker complete as shown in

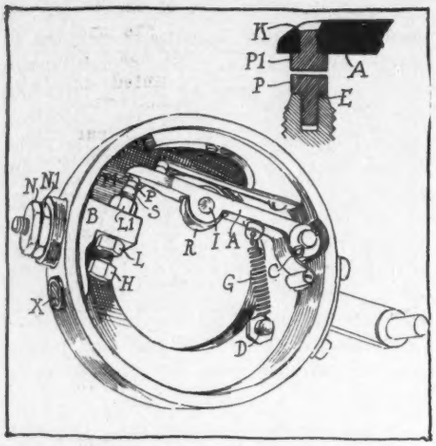


FIG. 3.—SPLITDORF CIRCUIT-BREAKER

Fig. 3 to the factory or one of its branches for repairs and it will be returned to you promptly and in good shape. If you are a mechanic, disassemble the affected parts from the circuit-breaker box and either send them alone to the factory to be fixed up or have a pair of points sent you.

To disassemble the parts to which the points are attached, slip the spring G from the ball-headed post D, clamp the ends of the cotter pin C together with a pair of small pliers and draw it out, then remove the lever A; the adjustable contact screw cannot be removed unless the block B is disconnected from the circuit-breaker box, therefore to disconnect the block B, first dig the wax from the point X and unscrew the screw which it covers. This wax is soft and may be removed with the blade of a small pocket-knife; next loosen nut N, then N1 and remove the block B.

Sectional views of the ends of the contact screw and lever A respectively are shown in their relative positions in the upper right-hand corner of Fig. 3; the points P and P1 being adapted to fit in recesses as indicated. In removing the points there generally is enough stock left that a grip upon them may be obtained with a pair of pliers, so that the point P may be simply pulled out of the end of the screw. As the rear end of the hole in the lever A is counter-sunk or flared out so that the point therein may be riveted into place, it must be driven out from behind with a small drift or a nail of suitable size and with a blunt, flat point. To replace the points, the point in the lever A should be riveted as shown at K; and if the edge E of the screw is slightly burred up before the point is driven into place it will hold it.

UNDOUBTEDLY CARBON

Portland, Conn.—Editor Motor Age—I have a 1909 model 17 Buick, equipped with a Remy magneto, in which I am troubled at present by the engine continuing to explode a few strokes after shutting off the current. Frequently the engine will run backwards finally for several turns. What shall I do to overcome the difficulty? I also find that my car heats up pretty well on the first and second speeds if used for hill-climbing any distance. What is the best method of removing carbon aside from taking off the cylinders to clean?—S. S. Hall.

As you seem to realize, your trouble undoubtedly is due to a carbon deposit in the cylinders of your motor, and perhaps the best way to remove the carbon without removing the cylinders would be by means of one of the chain devices or carbon removers now on the market. For the names of the concerns handling these Motor Age refers you to its advertising columns.

LEAKY PISTON RINGS

Brandenville, Pa.—Editor Motor Age—There was a query in the Readers' Clearing House asking how to detect a piston ring knock, and that question brings another. Is a ring, so loose in its groove as to make a knock, any good; the groove being turned concentric? The ring eccentric would leave quite a space under the ends of the ring; the pressure would go down the side of the groove and the ring, fill this space and would come up between the ends of the ring, which as Shop Kinks stated should be .010 to .015 inch apart, and unless the piston is fitted as close as the rings it looks like the pressure would leak through.

I tried an experiment and had a piston put together in sections, being held together by a piston rod. The cylinder was rough and hard on the rings. I had one ring in. It got to leaking badly until the engine stopped. I took the cylinder off and the ring was loose. I took a wrench and tightened the nut on the piston rod, springing the groove closer together, put the cylinder back again and started the engine up. It ran all right. This would seem to me that a snug fit sideways is essential. Have there been any experiments made to determine the best size for a given bore, width, thickness and piece cut out of a ring to give best results? If so, would like it for a 3-inch bore.

2—Why don't spark plug makers make the porcelain in the good old-fashioned way, the hole through the porcelain being of two diameters, the larger below to admit a collar or nut on the firing bolt about the middle of its length, the upper side of the collar around the bolt being packed with asbestos packing put in the larger bore and shoved up tight against the shoulder of the small bore and held there by the nut on top of the porcelain, the larger bore tapering gradually down almost to the small bore, leaving just a little shoulder for the packing to rest against? This makes an easy fit, compression-tight, and insulates the bolt from the oil and wet side of the porcelain. When the packing gets oil-soaked it can be readily taken out and replaced and the plug is as good as new, as this is where the short circuiting occurs. A bolt fitted into a head, and this head crimped into the top of the porcelain is a nuisance, as the bolt can't be taken out when the plug fouls to clean it and the plug is done for. An asbestos washer between the shoulder of the casing or shell, and the under side of the collar of the porcelain, and another between the top side of the porcelain shoulder and the bushing helps the insulation and makes an easy compression and tight fit.

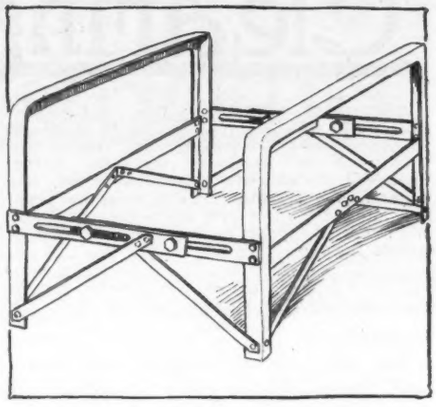


FIG. 4—ADJUSTABLE MOTOR STAND

Using such a plug, I had no plug troubles, although I had some very poor mixtures in trying different types of carbureters. I used an excess of oil in the cylinder and it dripped out of the exhaust pipe, but it sparked ahead just the same. The porcelain cracked in two and I bought another plug, which lasted 2½ hours; then bought another, which was higher priced, and it never fouled and lasted 9 hours; the next lasted 16 hours, but it had a crimped head and I could not clean it; I purchased some others with the same result, and finally had a plug made at a local pottery concern and am using same old plug again.

3—Looking at Motor Age's illustrations of the Algonquin hill climb chassis one gets the impression that the greater weight is on the front wheels. Designers of locomotives aim to get the maximum weight on the driving wheels. There is a proportion between the weight and surface contact of the wheels and the power or traction they will stand, and to attempt to go beyond this is folly. To put on the rear wheels alone such a colossal power as 120 horsepower looks too much like a lot of kids playing a huge game of make-believe. The small gain in time is all out of proportion to the power used. If the Benz car had four-wheel drive, the rear wheels having the usual differential arrangement, the front wheel pivot steering wheels would allow a ratchet drive, because steering either wheel would not then make a backward twist on the power shaft. Either front wheel would be free to go ahead as in making a turn, but if either rear wheel started to spin, as in mud or sand, the ratchets cut it short by pulling the load with the front wheels. In making a turn backwards by a peculiar construction of the ratchets they are withdrawn, leaving the front wheels free to turn either way, otherwise the outside wheel would bind on the ratchet—the rear wheels drawing the car backwards. By such an arrangement

the entire weight of the car is utilized for traction, each wheel contributing a portion to the push of the car. A car so equipped is not only speedier but safer to ride in and less likely to skid. Some object to the Ford cars for this reason. The engines are too powerful for the light weight of the car, the wheels lose their grip and jump about at high speed.—Joseph Munden.

1—From ten to fifteen thousandths of an inch is the spacing generally allowed between the ends of the piston rings when fitted into a cold cylinder. Practice has taught that this is about the right amount of space. When an engine becomes warmed up the expansion or elongation of the ring due to the heat practically closes up this gap. Whatever pressure does get through the slot of the first ring may be stopped by the second ring and that which gets into the space behind it, only tends to force the ring closer into contact with the surface of the cylinder walls, rendering them more gas tight. A piston ring which is so loose as to cause a knock is no good and should be replaced as soon as possible.

2—In the February 9 issue of Motor Age, pages 26, 27 and 28, most of the different makes of spark plugs on the market were shown, and it is quite possible that among these you will be able to find some of the old-fashioned types in which you have so much confidence. Spark-plug makers are constantly endeavoring to make their plugs as reliable and fool-proof as possible. It is the belief of some manufacturers that to make it possible to readily disassemble a plug is in reality bad practice, because drivers often will endeavor to disassemble a plug to clean it when disassembly is really unnecessary and the cleaning could be done very thoroughly by simply dipping the plug in gasoline and perhaps using a stiff bristle brush. In disassembling a plug, packing is generally destroyed, lost or improperly replaced, or the nuts are drawn up so tight that either the porcelains are cracked immediately upon tightening the nuts or soon after the plug becomes heated, because no room is allowed for expansion.

3—The work that is done by the locomotive is hardly to be compared with that of the motor car. The motor car rarely pulls anything other than the car itself, and under normal conditions the traction obtainable by the two rear wheels is sufficiently great to absorb all the power that the motor is capable of delivering to the rear wheels. The locomotive is required to pull a great many cars, and the power of the locomotive is often greater than even the traction of all of its wheels; it is necessary, therefore, that more attention be given to the tractive power of the locomotive than to that of the motor car. The four-wheel drive for the motor car certainly has its advantages over the two-wheel drive, and many experiments are now being made with the four-wheel drive in Europe, while there are several manufacturers of four-wheel drive in America; the added complications, however, necessary to secure the advantages of the four-wheel drive have prevented it from becoming universally adopted.

TYPES OF MOTOR STANDS

Oklahoma City, Okla.—Editor Motor Age—Through the Readers' Clearing House will Motor Age inform me where I can secure adjustable type motor stands? Or will it illustrate different types so that I can have such a stand made?—O. S. Kelly.

In Fig. 5, three types of motor stands are shown whose cradles are adjustable. These stands greatly facilitate the operations of the repairman during the process of motor overhauling. They are not adjustable, however, in the sense that a single stand can be used to support different types and sizes of motors. A stand designed for different sized motors is shown in Fig. 4; this stand is so constructed that the side members can be adjusted to any reasonable width, but does not afford the convenience of the stands shown in Fig. 5. The stand shown at the left in Fig. 5, represents a type used in the assembling and repair departments of the Corbin motor car factory; the adjustable frame consists of angle iron side rails, a cast iron cross member which is pivoted at its center to a cast iron upright of the base, and a large cast iron ring mounted on rollers attached to the other cast iron upright of the base. The stand in the center and the one at the right are operated on the same principle, both having cradles mounted in semi-circular grooves in the base. The central stand was seen in a motor car repair shop at Syracuse, N. Y., and the one at the right is to be seen at the Packard motor car factory or in the shops of almost any of its dealers. It might be possible to get these stands from the factories using them, as the Packard company furnishes them to its dealers; the stand shown in Fig. 4, however, is a home-made angle iron structure that could be made by almost any blacksmith.

CHICAGO TAXICAB BUSINESS

South Chicago, Ill.—Editor Motor Age—Information as to the taxicab business in Chicago is desired. How much does the average taxicab make per day or week when it is operated by the owner? I have a small amount of capital and am anxious to start in for myself. I have been a chauffeur for some years.—R. Roberts.

Officers of large taxicab concerns declare that at the present time none of the companies is making any money out of the business nor do they think the single-rig business is a paying venture. The average receipts of a taxicab operating for a taxicab concern are reported to be $14 a day, whereas the independent driver running a single car takes in from $7 to $9 a day, depending of course upon the stand he has and the business he gets. In your case it would seem as if the outlook were not very bright, for taking the estimate of from $7 to $9 a day receipts, you would have to charge off against that your salary, your investment in the car, the depreciation on the car and its maintenance, which would not leave much in the way of profit, some of the wise ones think.

Possibly in a smaller town there would be more chance to make money out of a single car. Supposing you did not have to go on a public stand but depended upon private calls for your business. In a small city there is a good deal of this sort of patronage and it shouldn't take long to work up a good clientele among persons who would use your cab for trips.

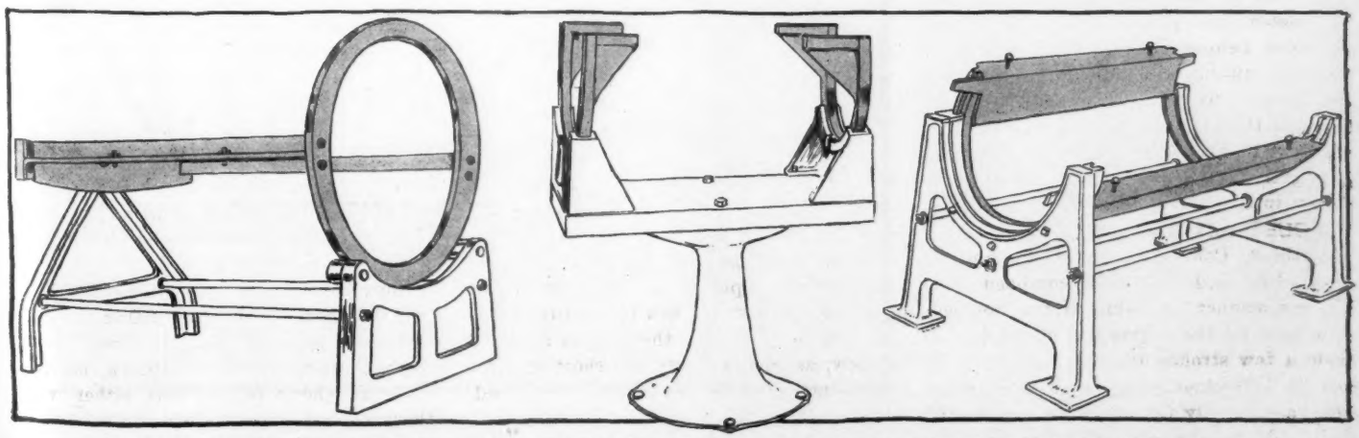


FIG. 5—SHOWING THREE TYPES OF CONVENIENTLY ADJUSTABLE MOTOR OVERHAULING STANDS

Refinements on Marmon 32 Chassis

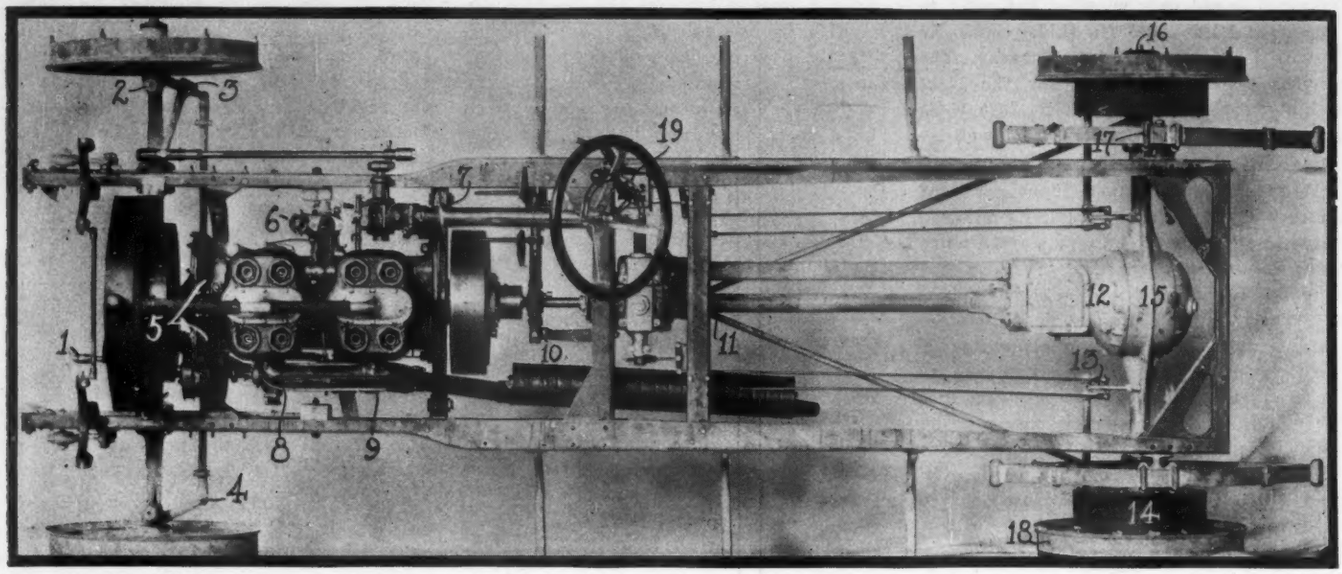


FIG. 1—SOME ALTERATIONS MADE IN THE MARMON 32 CHASSIS

1—The starting crank clutch has four positions, it had two, this allows the crank to remain in any one of the four when driving and facilitates cranking. 2—A race of Schafer ball bearings at the top of the steering yoke carries the car load. 3—A hardened pin is used to hold the end of the tierod into the steering arm, the eyehole in the arm being bushed. 4—This end of the tierod is threaded and clamped for adjustment. 5—The oil is now forced to the two front camshaft bearings direct from the oiler. 6—There is an air adjustment for the carbureter on the dash. 7—A support is added for the steering column at the dash; it rests on the pressed steel motor support. 8—A two-spark Bosch magneto with two plugs for each cylinder is now used. The plugs are located in the valve caps. 9—Water intake pipes enter the cylinder jackets horizontally instead of at a 45-degree angle, leaving the valve springs more accessible. 10—The clutch rocker arm does not extend from side to side of the frame but is carried at the left on a bracket extending forward from a cross member of the frame. This gives a freer action for the clutch and brake pedals. 11—A larger bearing surface is used for the propellor-shaft inside of the torsion tube. 12—An adjustment is provided here on the bevel pinion so that it can be moved to or away from the differential bevel. 13—Adjustable stops are used here for the brake operation. 14—Brake drums are increased 14 to 16 inches in diameter and brake shoes supports changed. 15—A new Marmon differential of the bevel type is used. 16—Jaw clutches upon the ends of axle driveshafts are now integral with the shafts, and the clutches bolt to the wheel hubs. 17—Bronze bushings are used in the rear spring eyes and hardened pins used. 18—Tires are 35 by 4½ all around, instead of 34 by 4; demountable rims are used. 19—Throttle and spark levers work on ratchet quadrants, instead of friction ones.

THE MARMON 32, which has been the sole chassis of the Nordyke & Marmon Co. for several years, will be continued, with numerous refinements all of which are graphically drawn attention to in Fig. 1 and the caption beneath it. The Marmon Co. is averse to annual models and consequently in continuing its 32 for another season has added the numerous changes as it has seen fit. The motor remains at 4½ by 5 inches.

Beginning with the chassis in general these alterations appear first in conjunction with the steering mechanism in that the yolk ends on the tierod between the steering knuckles have been improved. This rod is made adjustable by the yolk on the left end threading onto the rod and having a clamping bolt in conjunction. On the right end the yolk is threaded and brazed onto the end of the tierod so as to eliminate any possibility of looseness. The arm from the steering pivot to which the tierod attaches is fitted with a bushing through which passes a hardened pin holding the tierod in place. This is the construction used for both ends of the tierod. A race of Schafer ball bearings used in the top of each steering knuckle takes the load.

Before leaving the steering gear details attention is drawn to Fig. 3, which shows an improvement in the way of a support S for the steering column. This is a casting resting on the steel stamping which forms the rest for the motor and at the upper end of it bolts direct to the steering gear case. This is undoubtedly one example of experience gained by racing cars, as the majority of concerns building stock cars which have entered in road races have been forced to use something of this

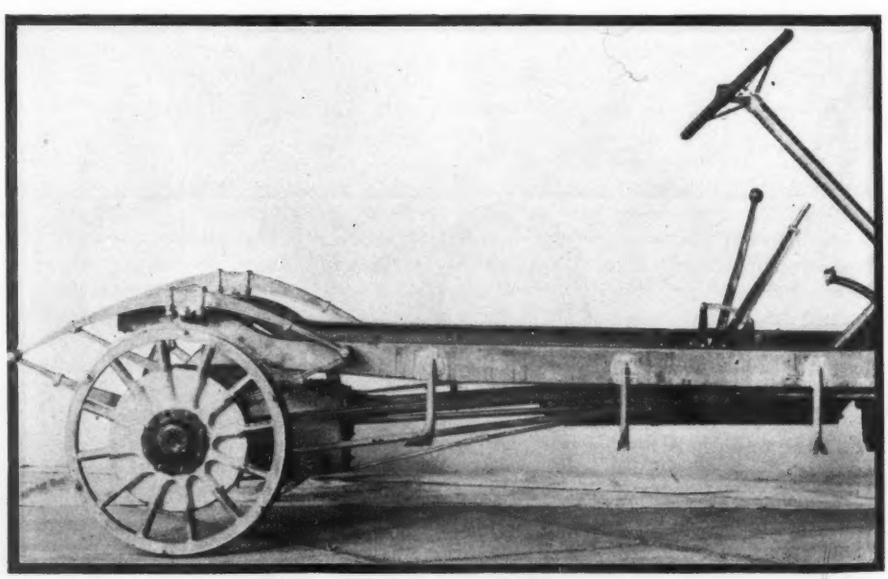


FIG. 2—MARMON ELLIPTIC REAR SPRINGS

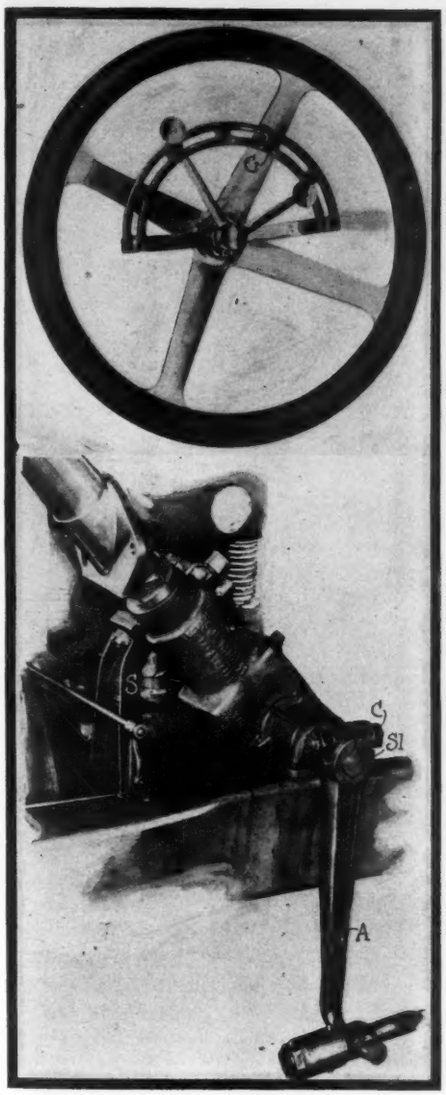


FIG. 3—IMPROVED STEERING FEATURES

nature to properly reinforce the steering column. The steering gear used is a Gemmer type of the worm and sector design, the worm being carried between upper and lower thrust bearings and the sector supported in eccentric bushings which serve to maintain the required adjustment of the sector to the worm. The upper end of the radius arm is split to fit over the square end of the shaft S1. The Marmon Co. is one of many to follow the practice of carrying the shaft S1 above the frame, thereby eliminating the necessity of drilling a large hole in the side member. One other detail shown in this illustration is that the throttle and spark controls on the steering wheel work on a toothed-segment G whereas formerly they have worked on a friction segment. With this improvement it is first necessary to press downward on the button on the end of each lever in order to disengage it from the row of teeth beneath the segment.

Passing to the rear end of the running gear attention can be drawn to another important change, namely, the increasing the diameter of the brake drums from 14 to 16 inches. These drums are made 4 inches wide, so as to accommodate the two sets of internal brakes which are placed side by side. The relative position of these brakes is shown in the top of the illustration, Fig. 4, both sets made up of one-piece band, B, 2 inches wide and faced with Thermoid. Each band is expanded by a cam, K, carried on the end of an operating rod, K1, which rod finds support at its inner end and a bracket, B, on the axle housing. The support of the brake bands, B, has been improved by a transverse carrier, K2, which acts as a diameter of the drum. At one end this carrier supports the expanding cam and at the opposite end it is squared and enters between flanges F on the drums, thereby constituting a form of support. During the present year this carrier, K2, did not extend from one side of the drum to the other and the expanding cam was supported by a hinged member which gave a more or less floating support to the cam. With this eliminated the action of the cam in expanding the shoes is more positive and the action of the brake against the drum is more equal throughout its entire periphery.

A still further improvement in conjunction with the brakes and which aids in securing an even application of the brakes on both wheels is the adoption of adjustable stops, S, which bear against the arms, A, on the brake rocker rods. These stops, S, limit the amount of backward movement of the arms, A, and by means of lock nuts, N, the brake rocker arms can be set so as to permit of release of the brakes, but to avoid any slack beyond this release point, which is equivalent to the elimination of slack in the brake connections. The net result is that the work of the equalizers is more efficient and it is assured of equal working of either the foot or hand brake on each wheel when applied. It is a fact that with many brakes although equalizers are used, that when applied only one wheel locks, the other continuing to revolve as if the brake were inoperative. It is to avoid this that this additional precaution has been taken.

The method of adjusting the brake connections is shown in assembly view, Fig. 7, which also shows a detail clutch improvement. It is a worm-and-gear adjustment. The sector, M, with its serrated hub, fits onto the brake pedal shaft. The toothed segment, W, receives a worm which is connected to the forward end of the brake rod. This worm is adjustable and by turning it one way or another it travels on the segment, W, thus tightening or loosening the brake connection rod as required.

Fig. 5 shows the left side of the motor and also that portion of the right side containing the carbureter, oil pump, intake manifold, etc. Most notable in connection with the motor is that the water intakes, E, to the water jackets are horizontal, whereas heretofore they have been at an angle of 45 degrees. Making them horizontal has raised the intake water pipe so that now it leaves the valve stems free for removal, the figures, 1, 2, 3 and 4 showing how accessible all four of the valves on the exhaust side are, and 5 and 6 showing the accessibility of these springs on the intake sides.

More or less change has been made in conjunction with the lubrication of the motor. The company continues to use the forced system without splash—that is, the crankshaft is drilled and the oil from the gear pump forces the lubricant direct to the main bearings of the shaft, whence it passes through the drilled shaft to the lower connecting rod bearings, and also up tubes in the connecting rods to the wrist pins. This gives a positive circulation of oil to the eleven important bearings of the motor, these eleven being the three main bearings of the crankshaft, the four lower connecting rod bearings and the four wrist pin bearings. But for next year the company has gone further, and feeds oil under pressure to the two front camshaft bearings, which has been accomplished by con-

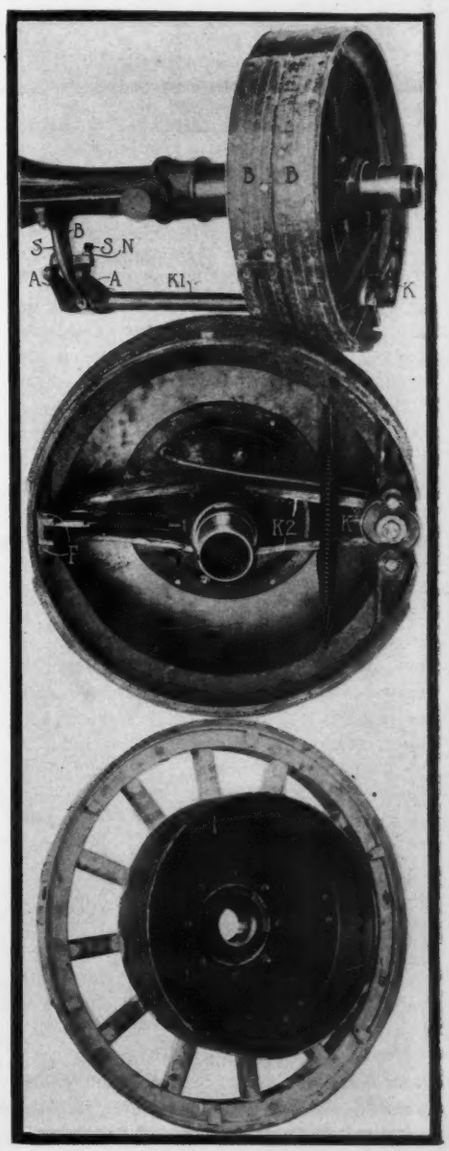


FIG. 4—LARGER AND IMPROVED BRAKES

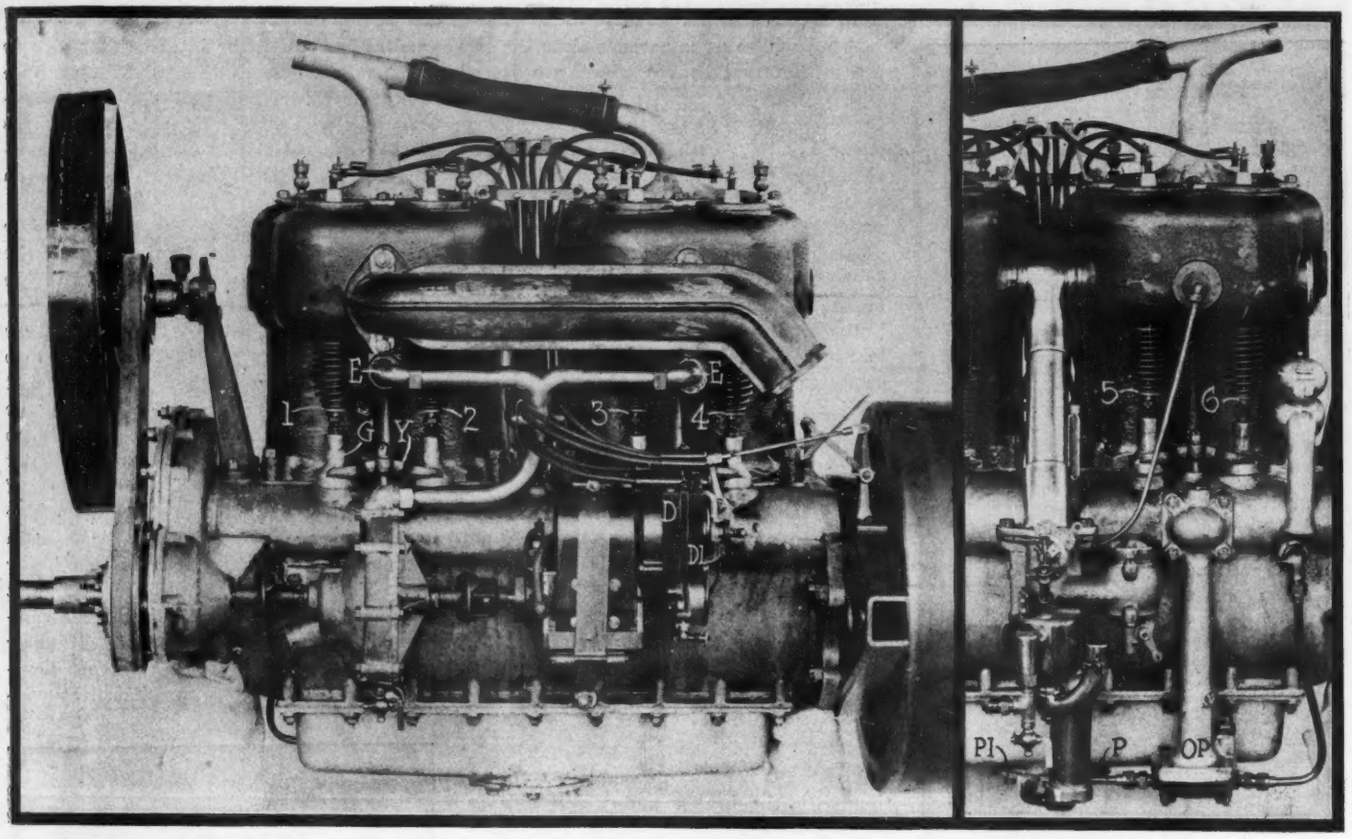


FIG. 5—BOTH SIDES OF MARMON MOTOR SHOWING CHANGES MADE

meeting leads to these from the oil pump.

Now for the lubrication changes. The Marmon company aims in 1912 to keep the oil out of the cylinders more than during this year. To do this it has placed baffle plates in the bottom ends of the cylinders. These plates obstruct the entire lower end of the cylinder, but have a slot through which the connecting rod works. Baffle plates have been used by a great many concerns building high-priced cars for the last 2 or 3 years and their object is to prevent a surplus of oil getting on the cylinder walls and working past the pistons and sooting up the spark plugs as well as carbonizing in the combustion chamber.

There is another lubrication change in conjunction with the filter for the oil pump. The oil pump OP, Fig. 5, is carried outside of the crankcase at the lower right and draws its supply of oil through a pipe P from a filter P1. This pipe P does not draw from the bottom of the filter chamber but from the top and inside of the gauze, the object being that the purer oil is drawn and any sediment collecting in the base of the filter chamber is not in danger of being recirculated and can be drawn off when required.

The Marmon ignition has been improved, in that a two-spark Bosch magneto is now used, delivering its spark to two plugs in the same cylinder, one over the intake and one over the exhaust valve. This two-spark magneto has a double primary and also a double secondary winding on the armature. Both primaries lead to the same breaker box mechanism. The secondaries

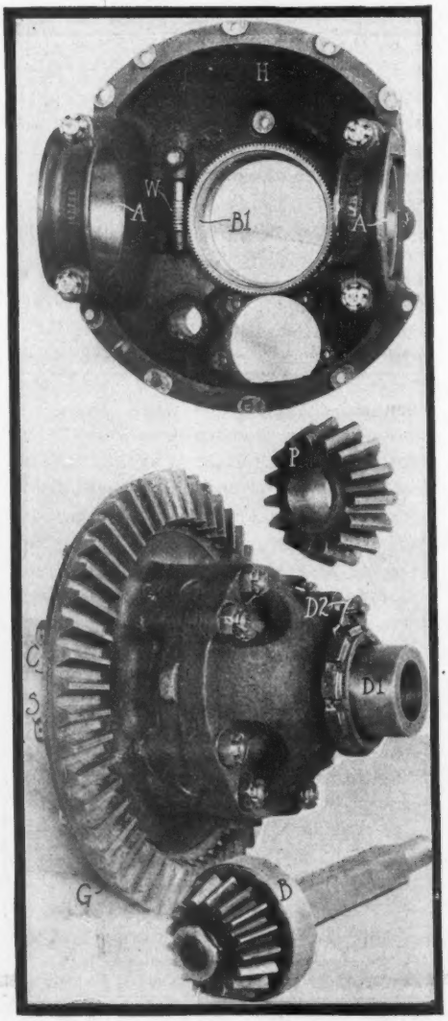


FIG. 6—NEW MARMON DIFFERENTIAL

are separate and lead to two distributors, one D and the other D1.

There have been a few changes made in the structural features of the motor; for example, the valve lifter guide G was held against turning by the yokes Y, but now the guide has an integral vertical key in it which works in a corresponding keyway in the crankcase, which prevents the guide from turning and leaves the yoke Y to play the single role of holding the guides firmly in the crankcase. The one-piece aluminum crankcase is continued and is carried on a three-point support. The rear support is a channel section steel stamping of diamond shape cut away in the center to receive the extension of the crankcase which forms the rear bearing of the crankshaft. The forward support is a trunnion on the cross member of the frame. This flexibility in the motor support eliminates any chance of binding on the crankshaft bearings should one of the road wheels be on a mound or in a hole.

A detail improvement in the clutch is that the clutch rocker shaft terminates at 10, Fig. 1, instead of continuing across the left side of the frame. This has been done to prevent any possibility of binding on the brake rocker shaft when the clutch is disengaged or vice versa. Fig. 7 shows these parts. The clutch rocker tube T is shown and inside of it goes the brake shaft. The end of the clutch rocker tube is serrated at T1 to receive the pedal T2. This serration takes the place of any clamping bolt or other locking device and has the additional advantage of permit-

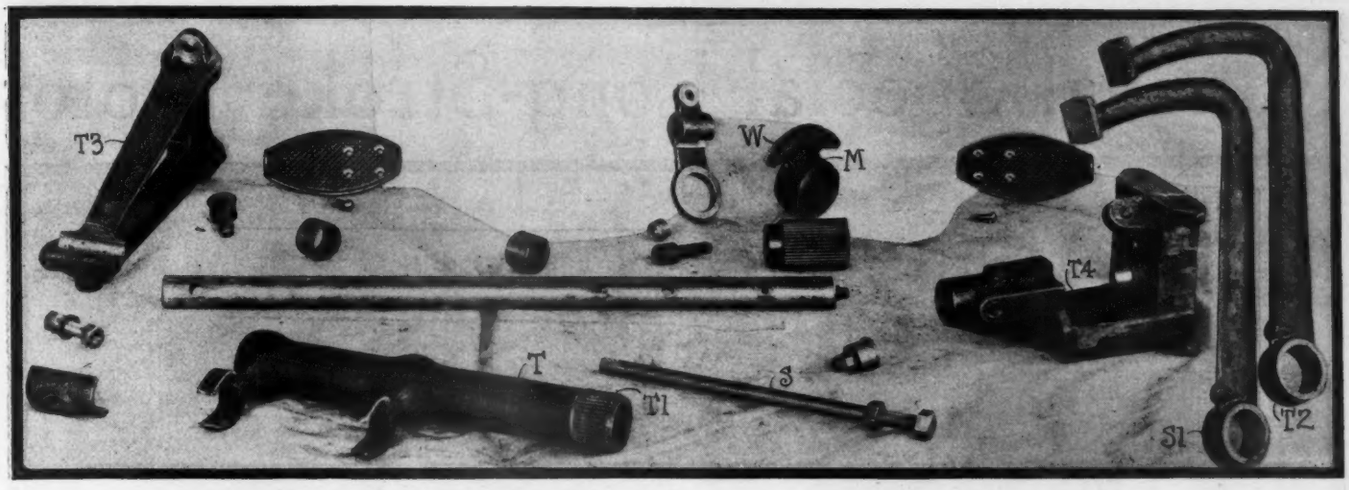


FIG. 7—ASSEMBLY OF PARTS IN CLUTCH AND BRAKE OPERATION

ting of adjustment, as the pedal can be set at any relative position on these serrations. The same applies with reference to the brake pedal S1. The bracket T3 is used for carrying the left end of the brake shaft. The bracket T4 is used for supporting the right hand of this shaft. Adequate means are provided for lubricating the shaft where it lies within the tube T. The clutch is a cone one, faced with thermoid and having six radial plungers with springs carried in the cone and pressing outward on the thermoid.

Passing at once to the rear axle of the Marmon the most important change is the employment of an entirely new differential, illustrated in Fig. 6. This differential is of the bevel gear type, and is characteristic in that the gear G is solely a ring, or circle of teeth which bolts to the casing C, a set of cap screws S holding the two together. Using a ring of teeth is supposed to give a quieter differential. The noise in the differential is due to vibration and the vibration is caused by the pinion P on the end of the gearset shaft meshing with the bevel G. It is a law in physics that the greater the body or mass in vibration the louder the noise, consequently by reducing the size of the gear G to a mere circle of teeth the quantity of mass and vibration is reduced, which should result in a quieter gear.

A quiet differential means one that can be accurately adjusted; that is, the adjustment between the pinion P and the gear G should always be the best obtainable. This has been arranged for by mounting the bearing B in the cage B1, which cage threads into the housing H, so that by turning the cage B1 in the housing the bearing B, together with the pinion P, can be moved up to or away from the gear G to give the necessary adjustment. This is accomplished by the use of a worm W in mesh with a circle of external teeth on the cage B1. The upper end of the worm shaft extends to the housing and is accessible from the outside, it being visible in Fig. 1.

But there is still another adjustment furnished, namely, that of moving the gear G to the right or left to bring it into proper mesh with the pinion P. To understand how this is done it must be remembered that the entire differential is carried on two Timken roller bearings D, which also serve as thrust bearings. The relative position of the differential with reference to these bearings depends on two locking rings D1, which thread onto the housing C. By means of turning these rings the right or left movement, as required, can be obtained. A locking mechanism D2 is provided. The differential is a typical bevel type with a heavy forged cross Z carrying the four planetary pinions.

Further in conjunction with the rear axle should be noted increasing in size of the single Schafer bearing which carries the rear wheel from No. 310 to No. 311. A change has also been made in that the two axle drive shafts connecting between the differential and the road wheels have integral end clutches which bolt to the hubs of the wheels. The rear wheels have been made heavier, the spokes being 1⅝-inch, whfereas they were 1½ inch in size. The front wheels are also heavier, the spokes measuring 1¾-inch instead of 1½.

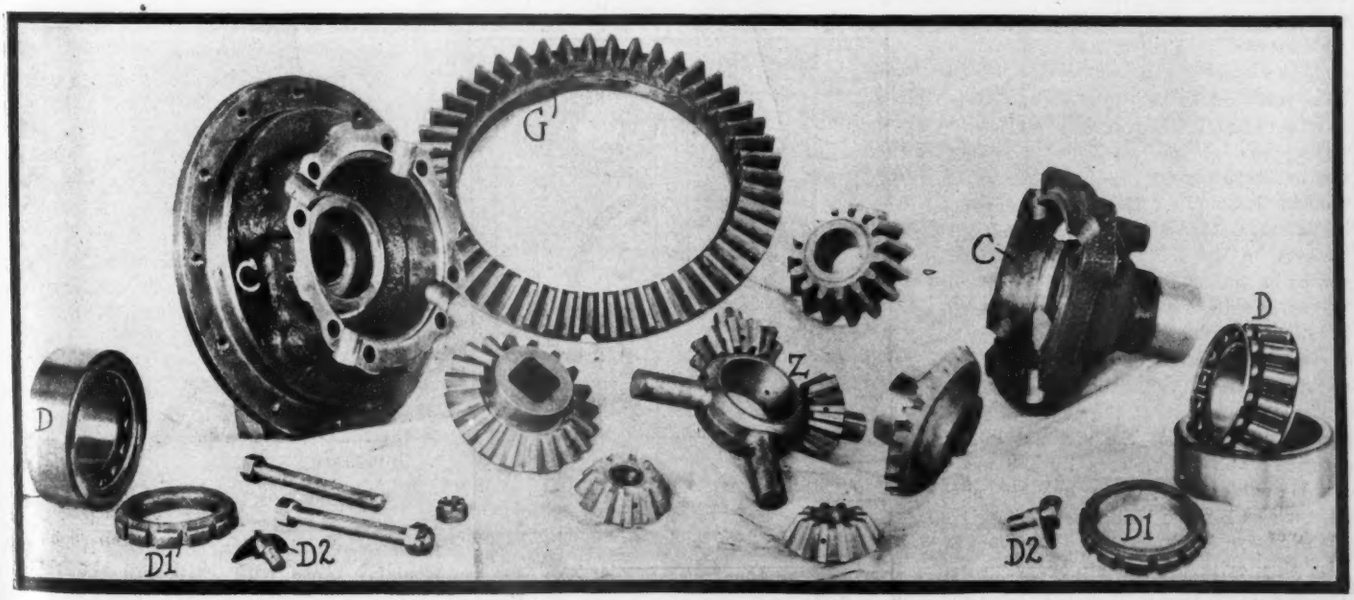
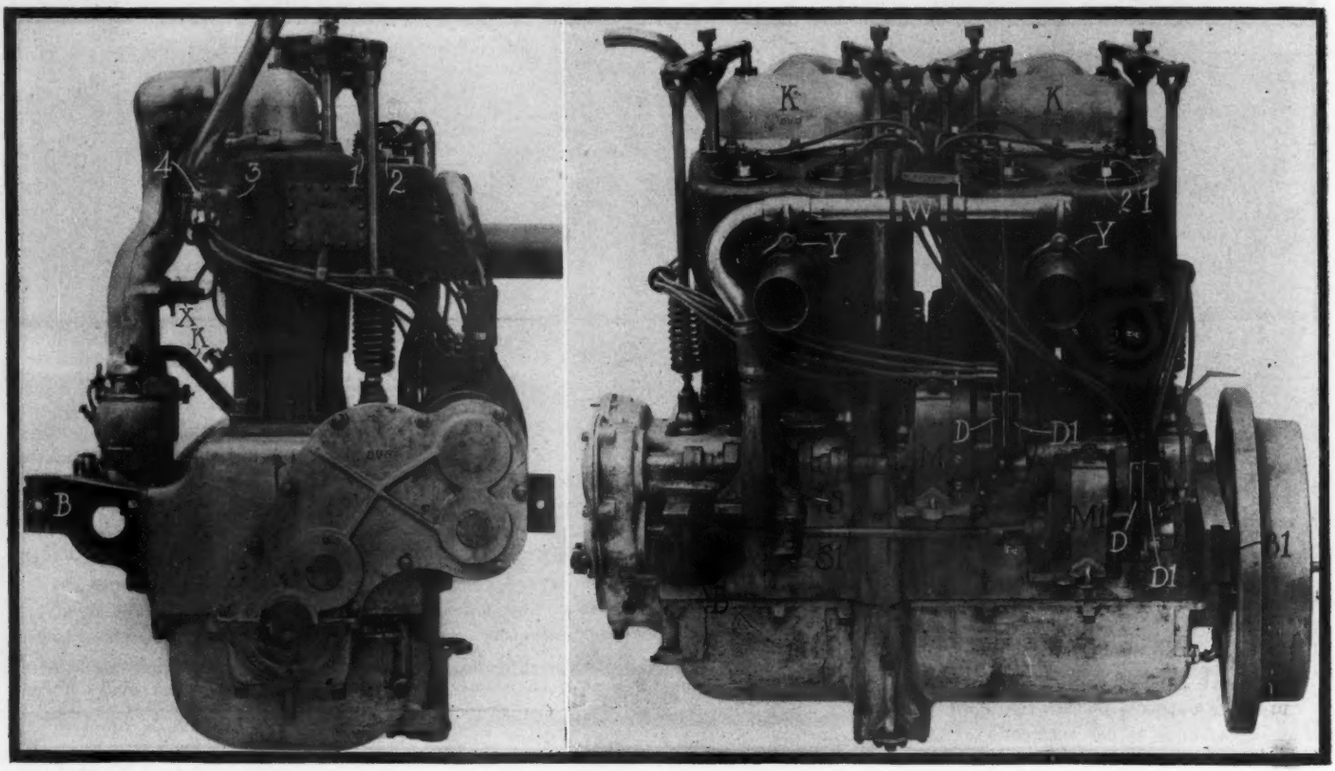


FIG. 8—PARTS IN THE NEW MARMON BEVEL GEAR DIFFERENTIAL

National Special Long-Stroke Motor



FIGS. 1 AND 2—NATIONAL SPECIAL RACING MOTOR WITH QUADRUPLE IGNITION SYSTEM

National Tries Out Many New Ideas in Its Special Racing Motor—Adapts a Long-Stroke Motor—Uses Two Magnetos Giving Four Sparks in Each Cylinder at Same Instant—Other Special Schemes Tried

THE exact status of the long-stroke motor, while it is being tried out by manufacturers of pleasure cars, has also been tried out this year by one or more racing cars. The National Motor Vehicle Co., Indianapolis, made its trial of this type of motor by building a special model for the recent Indianapolis races, which car showed remarkable horsepower on test as well as phenomenal speed on the track. This motor, illustrated herewith, has a right to be classed with the long-stroke types in that the bore is 5 inches and the stroke 7½. This is a stroke-bore ratio of 1½ to 1, a ratio which is only equalled by one or two touring cars during the present year. Fig. 4 shows the nature of the L-type cylinder casting used in this motor. The cylinders are cast in pairs and have the exhaust valves in pockets on the left side, and the intake valves in the heads. The diameter of both valves can be seen. Each is 3¼ inches in diameter. The 5-inch cylinder has a piston head area of 19.6 square inches and the area of the valve opening is 8.3 square inches, so that the valve is almost one-half the area of the piston head. In a few French racing cars by the use of double valves the valve opening space has been as high as 75 per cent of the area of the piston head.

In this cylinder casting every precaution has been taken in the waterjacketing role, this being brought out by the annular spaces J1 and J2, Fig. 4, which entirely surrounds the seatings of the intake and exhaust valves. Every effort has been made to cool the exhaust side by the larger water space J and also by the space J4, which surrounds the exhaust passage below the seating of the valve. By this method of jacketing the temperature of the exhaust is reduced at the earliest moment and any back pressure, which might prevent the exhaust seating, is eliminated. With high speed motors actual tests have shown that at speeds of over 2,500 revolutions per minute the exhaust valves fail to seat for one cause or another.

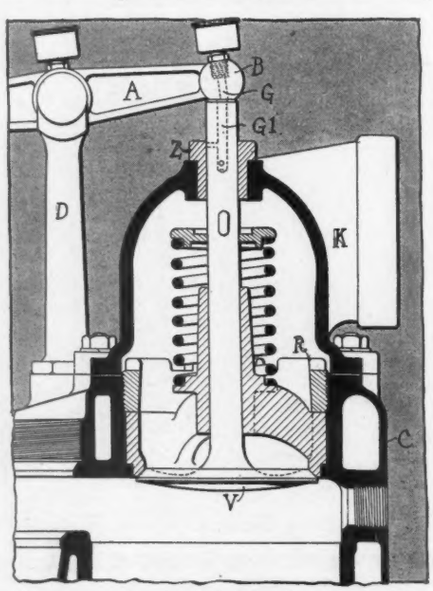


FIG. 3—INTAKE VALVE NATIONAL SPECIAL

Fig. 3 shows the scheme of housing the intake valve V, which is located in the cylinder head. This valve fits into the cylinder C and is enclosed by an aluminum housing K, which forms part of the intake manifold. The valve stem ends at the top in a cup receptacle into which bears the ball end B of the rocker arm A. The ball end carries a grease cup and is drilled at G to deliver the lubricant into the receptacle in the upper end of the valve stem, and there is a further drilling G1, by which the lubricant is conducted down to lubricate where the valve stem passes through the sleeve Z in the housing K. This method of lubrication is one great essential in racing cars, and particularly those with valves in the head because many of them have been troubled with broken valve stems, due partly to side thrust caused by the rocker arm.

One remarkable feature of this motor is the adoption of four spark plugs on each cylinder, the exact position of these being shown in Fig. 1. Two plugs, designated 1 and 2, are placed side by side in the cap of the exhaust valve, and two others, 3 and 4, are mounted horizontally on the opposite side of the cylinder. The object of these four plugs in the cylinder and having four sparks occur instead of one is to get higher speed due to a quicker explosion. The spark from two plugs produces greater heat than that from one; and delivering two sparks simultaneously at the opposite side of the cylinder starts the explosion at two points, and so the period of time consumed in flame propagation throughout the combustion space is cut in two. The National company claims by test that at 1,700 revolutions per minute using four plugs the motor generated 140 horsepower; and that at 1,700 revolutions per minute using two plugs it showed 128 horsepower. This is a high power output.

To deliver four sparks simultaneously in the same cylinder requires two magnetos, M and M1, Fig. 2. Both of these are Splitdorf double-distributor types. Each has a distributor D, from which four wires pass to one set of plugs, and another distributer D1, from which four wires pass to another set of plugs. In this way two magnetos give the required four sparks for each cylinder. These magnetos are made with armatures carrying two primary and two secondary windings, being, in fact, a double armature. A secondary winding connects with one distributor and the other secondary with the other distributor. In this way both sparks occur at identically the same time, which

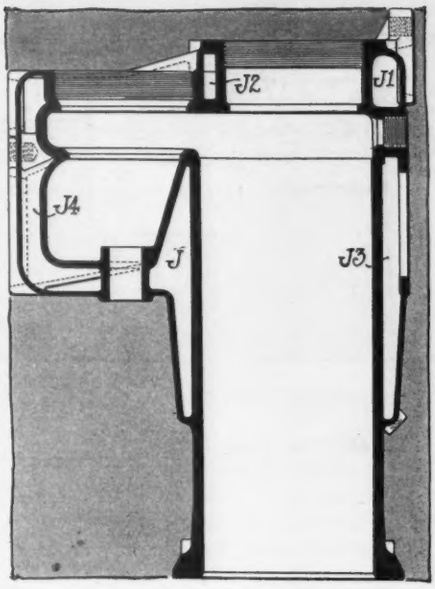


FIG. 4—CYLINDER OF NATIONAL SPECIAL

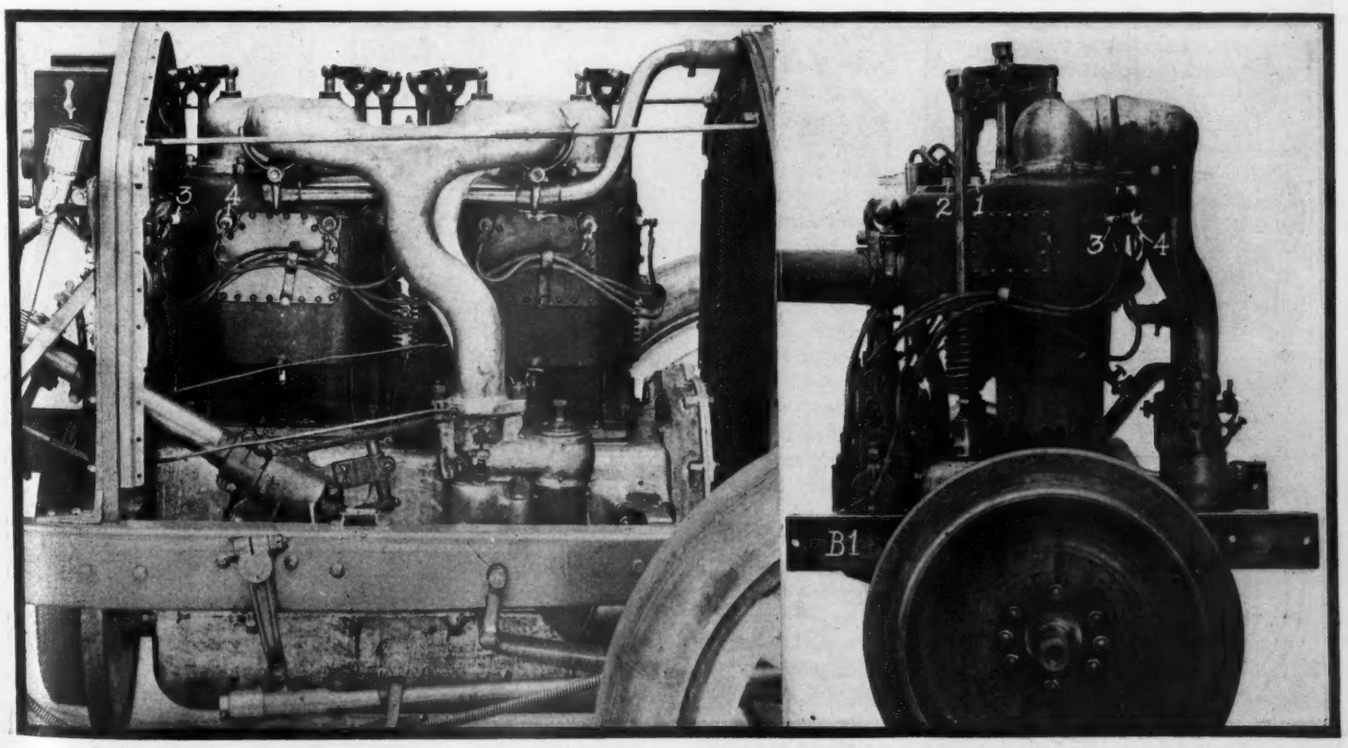
is necessary in order to get increased power by the multi-spark system. One magneto is driven through a continuation of the pump shaft S, and the other is driven by separate shaft S1. An examination of Fig. 2 will show how carefully has been guarded accessibility of the valve springs. Although two magnetos are used it is quite easy to reach and remove any of the valve springs.

Figs. 5 and 6 show a few details which are being generally adopted in racing cars at the present time, and also in many of the touring cars. One is the adoption of the brace K between the crankcase and the carbureter. At high speeds the vibration of the carbureter is such as to weaken the intake manifold and this has been guarded against in this way. Just above this brace is shown the auxiliary air valve X in the intake manifold. This valve supplies pressure direct upon the atmosphere to the cylinders and is responsible for increased speed as well as cooling the motor due to a reduction in the richness of the mixture.

In this motor the National designer has resorted to separate arms for carrying the crankcase. At the front are short brackets B, which bolt direct to the side of the case and extend to the side members of the frame. At the rear is a detachable cross piece B1. Supporting members of this style occupy less space and have greater strength than where the integral aluminum leg is used.

Fig. 2 further illustrates economy of design in that the yoke Y, which holds the short exhaust pipes in place, have an upwardly extending arm which anchors the intake water pipe in position. This is used on the National stock chassis. A hose union W is inserted in this water pipe between the cylinder castings.

A few of the internal details of this racing motor are shown in Figs. 8 and 9. The former shows the piston construction, which has been made with the object of obtaining maximum strength and minimum weight. But two piston rings are employed, these being carried in the grooves R near the piston head. Companies that have raced stock cars during the last few years have invariably taken out half of the piston rings during races and have found that they could increase the car speed by this method. The reason being that with excessive piston speed two rings are sufficient to retain the compression. A



FIGS 5 AND 6—SHOWING HOW FOUR SPARK PLUGS ARE USED IN EACH NATIONAL SPECIAL CYLINDER

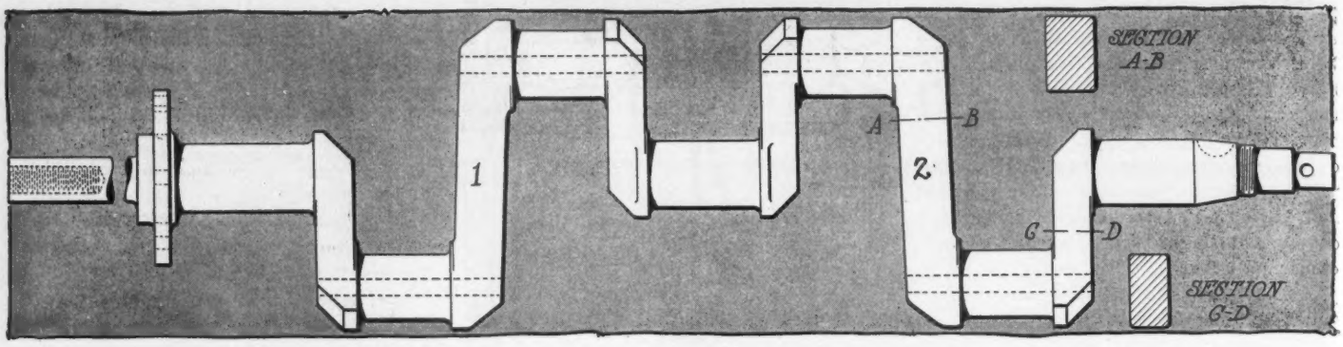


FIG. 7—NATIONAL SPECIAL CRANKSHAFT HAS SPECIALLY HEAVY CHEEKS A-B AND G-D

leat oiling device in this piston is the groove G inside of the piston and midway of its height. This groove is filled from the splash and has drilled openings leading to the piston walls. The perforation of the piston is to reduce weight. These perforations also assist in lubrication.

The lubrication of the connecting rods, Fig. 9, has been looked after by scoops S in the connecting rod caps, Fig. 9. These scoops are hollow and each time they dip into the oil force it to the bearing. In order to insure the lubrication of the wristpin at the upper end the bushing is cut away at C so that the splashed oil can readily drip in.

In Fig. 7 is shown the extraordinary heavy crankshaft used for this work. It is a three-bearing shaft and the precaution of insuring strength in the long tubes, 1 and 2, is shown by the section marked AB. The thickness of C-D is shown.

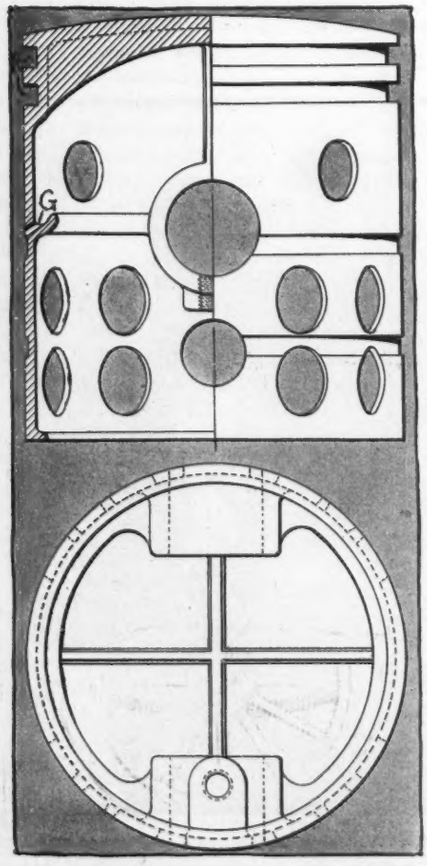


FIG. 8—PERFORATED NATIONAL PISTON

MOTOR CAR LITERATURE

"A CHART for Steering Clear of Motor Troubles" is the title of a folder issued by the New York and New Jersey Lubricant Co., New York, in the interest of its Motorol oil. A chassis chart is shown, fully lettered, showing each part requiring lubrication, with a key table telling which lubricant to use and the intervals at which they should be applied.

The American Asphaltum and Rubber Co., Chicago, has published a booklet entitled "The Right Road for the Automobile and the Farmer," which deals with the subject of highways and the company's product knows as the Pioneer road asphalt for roads. The book is fully illustrated, showing streets in different sections of the country where the product has been used.

The Norton Co., Worcester, Mass., is mailing to the trade a booklet dealing with the subject of "Safety as Applied to Grinding Wheels," which should be of interest to manufacturers, garagemen, etc.

A 10½ by 3¾-inch size red-colored post card from the Hyatt Roller Bearing Co., Detroit, Mich., draws attention to its noise-absorbing Hyatt bearings.

Another 1912 announcement is that of the Kissel Motor Car Co., Hartford, Wis., which is being brought to the attention of the public through an attractive catalog in three colors. All the pleasure models manufactured by this company are shown and described as is its line of commercial vehicles.

Catalog No. 11, from the Marburg Brothers, New York, describes and illustrates in a conventional manner the Mea magnetos. The various types of this instrument are fully explained and illustrated and included is a list of the parts entering into the makeup of the magneto, each part being illustrated.

A booklet from the Mayo Radiator Co., New Haven, Conn., illustrates solely types of radiators used on many of the leading American cars.

The Waterhouse & Lester Co., San Francisco, Cal., has issued its catalog No. 12, which is a voluminous affair of 620 pages, 10½ by 12 inches, the loose-leaf system being used. Motor car supplies of all descriptions are shown. A unique numbering system is used in the makeup of this catalog. The usual page numbers appear at the upper outside corners. On the lower outside corners, in pages representing merchandise, other numbers preceded by the printer's section mark are made use of. These numbers represent merchandise groups and are called "sections," thus obviating the necessity of continually referring to the index.

The Packard Motor Car Co., Detroit, Mich., has adopted what it styles a "Daily Feature Bulletin," which is a single page, 8½ by 11, its mission a daily reminder of the field of the Packard cars, both pleasure and commercial, and the various phases of the manufacture of these cars.

A large-sized post card, 9 by 5½, is the present medium used by the Standard Thermometer Co., Boston, Mass., to call attention to its line of speedometers.

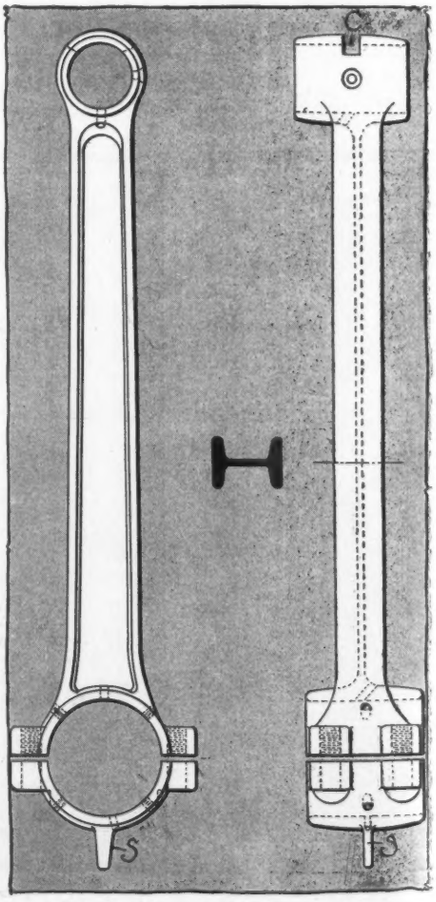


FIG. 9—LONG CONNECTING RODS USED

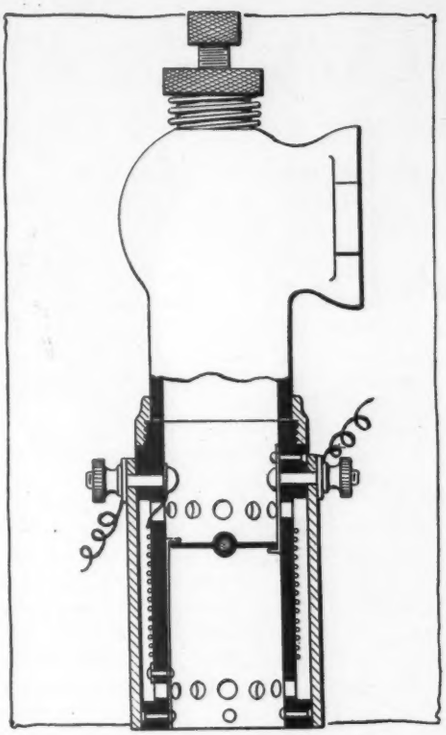
Current Motor Car Patents

STARTING-HEATER for Carbureters—No. 998,945, dated July 25; to Clarence W. Avery and Frederick E. Searle, Detroit, Mich.—This patent relates to an electric heater for carbureters which is designed to warm the incoming air to promote vaporization and thereby facilitate starting of the motor. It comprises an open ended tube, a valve in the tube for cutting off the passage of air therethrough, an outer tube spaced from the inner tube and forming a bypass for air around the valve, a heating coil in the bypass and electrical connections adapted to close the electric circuit through the heating coil simultaneously with the closing of the controlling throttle valve.

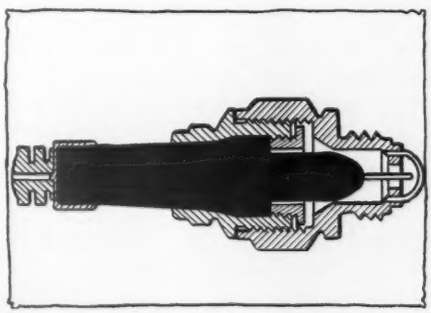
Denmead Friction Clutch—No. 999,016, dated July 25; to John W. Denmead, Akron, Ohio—This patent pertains to a contracting-band type of friction clutch embodying a driving member provided with a seat, a driven shaft, a sleeve fixedly mounted thereon, an arm carried by the sleeve, a circumferential band surrounding the seat and connected with the arm, a rocking lever suitably supported and connected with the loose end of the band, means engaging the free end of the lever and mounted on the sleeve and arranged so that when moved in one direction to rock the lever to tighten the band and a weight moved by the centrifugal force developed by the revolution of the clutch arranged to assist in contracting the band in direct ratio to the amount of centrifugal force developed, for effecting more positive clutch relation between the band and seat.

Falwell Spark Plug Design—No. 998,885, dated July 25; to Wray Falwell, Boston, Mass.—The spark plug to which this patent pertains comprises an insulated electrode, an insulating sleeve with an enlargement therein inclosing the electrode, a metallic shield surrounding the electrode and providing a passageway for the sleeve and an enlargement in but one direction, and means for closing the passageway and preventing the escape of the sleeve; and the other part consisting of a shell electrode adapted to be secured to and to communicate with a combustion chamber, and shaped to engage with the shield and inclose the closure means which renders the plug gas tight.

Ideas of the Inventor



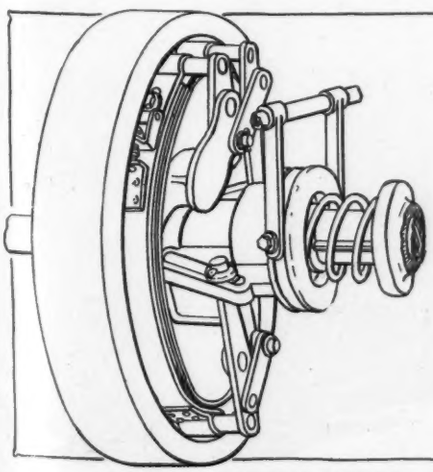
HEATER FOR CARBURETERS



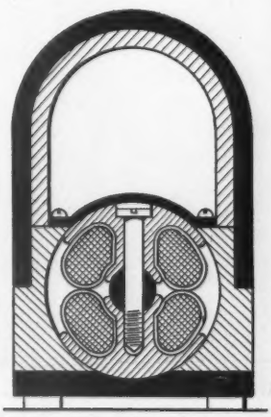
FALWELL SPARK PLUG

Automatic Dirigible Headlight—No. 998,846, dated July 25; to Herschel M. Herrold and Cresse P. Rhoads, Kansas City, Kans.—This patent applies to a combination with a motor car having a depending swinging steering arm, a headlight and a laterally-movable supporting bracket for the headlight, of a tube extending transversely of the machine and provided with a slot and terminating at one end in a curved portion, and endwise-slidable device in the tube, a part secured to the device, means rigid with this part and slidable in the slot, a movement-transmitting connection between this means and the bracket, and connections between the device at the curved end of the tube and the swinging arm, whereby movement of the latter in opposite directions shall impart endwise movement to the device in opposite directions, thereby moving the lamps in the desired directions.

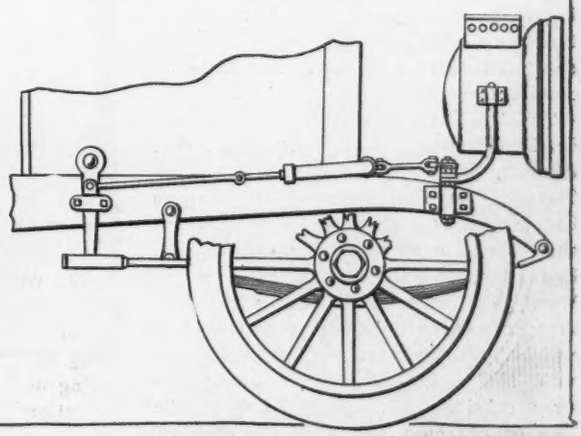
New Remy Armature Design—No. 998,635, dated July 25; to Benjamin P. Remy and Frank I. Remy, Anderson, Ind.—This patent relates to an armature for a magneto formed of a continuous shaft, a core formed of two similar separate parts having an outer segmental portion and inwardly extending shank with the inner end thereof concave to fit on the shaft, a form wound coil through which the shank portion of each part of the core extends, and means for securing the two parts of the core to and on opposite sides of the shaft, as shown in the illustration.



DENMEAD FRICTION CLUTCH



REMY ARMATURE DESIGN

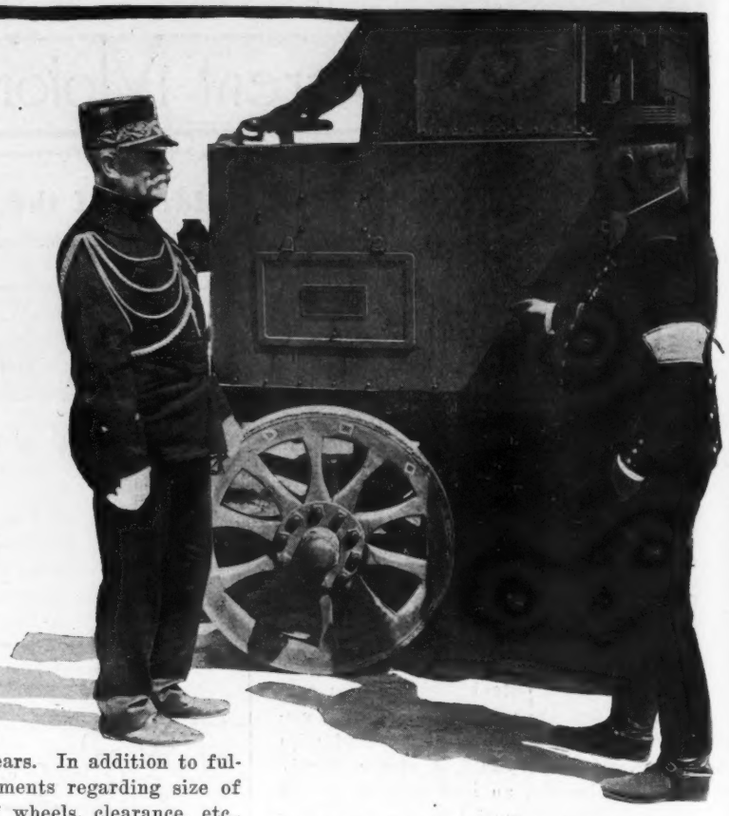


AUTOMATIC DIRIGIBLE HEADLIGHT

French Army Tests Trucks for Service Duty

Clubs and Civilians Barred

Subsidy System Made Use of



WITH a subsidy system in vogue in France, there is a tendency towards a certain uniformity in the production of motor trucks. The army is interested in gasoline trucks; prefers those carrying 2½ to 5-ton loads; insists on platform bodies with tarpaulin covers and full protection for the driver; must have a powerful sprag and hooks for a trailer or for hauling at front and rear; prefers steel tires but will accept solid rubber; insists on carbureters capable of using gasoline, alcohol or benzol; will accept nothing with a lower clearance than 12 inches, and has a keen eye for accessibility of organs and economic running.

These requirements tend rather towards external uniformity, and although the fifty trucks now under test may be very similar from the outside, there is plenty of variety in their design. This year the army is running the competition on its own account without any help whatever from the Automobile Club of France, and only one delegate of the manufacturers' association is admitted in an honorary capacity. The military authorities believe that they are capable of determining which vehicles are suitable to receive the army subsidies, and they certainly organized their test at Versailles in an excellent manner.

The firms taking part in the trials are de Dion-Douton, Malicet & Blin, Aries, Renault, Dietrich, Delahaye, Delaugers-Clayette, Berliet, Vermorel, Front-drive Latil, Peugeot, Bayard-Clement, Saurer and Purrey, a manufacturer of steamers. In several cases the firms are taking part in a military competition for the first time; in others they are presenting new models in order that they may be sold with the advantage of obtaining the army subsidies averaging $1,200 at the time of purchase and $200 for each of the 3 following years. In addition to fulfilling the requirements regarding size of body, diameter of wheels, clearance, etc., the trucks must remain on the road 25 consecutive days, averaging 100 miles per day with full load or none at all, in convoy formation when required, and with constant changes from gasoline to benzol and from benzol to alcohol. On the road their speed must never be lower than 7½ miles per hour or exceed 15½ miles. They are allowed 1 hour each night in which to fill tanks, oil and verify all parts, but they must not make use of any spares other than those carried on the vehicle; the consumption of fuel and lubricating oil will be controlled throughout the test, and the speed regulations and garage restriction enforced with precision.

Divide Motor Position

Judging from the fifty cars taking part in the competition—they comprise the latest and best models of the French factories—manufacturers abroad are of the opinion that the advantages and disadvantages of under-the-seat and under-the-bonnet position for the motor are about equally divided. There are only a few, chief among them being Saurer, that refuse to carry the motor under the seat, on the grounds that this position tends towards inaccessibility and consequent neglect. The majority make use of the two types.

In army circles a preference is shown for the motor truck equipped with steel tires, but the manufacturers are moving very cautiously towards the abolition of rubber, knowing that the use of steel tires necessitates extensive changes in chassis design. Renault is a notable example of

CLEMENT-BAYARD ARMY TRUCK WITH RENAULT HOOD

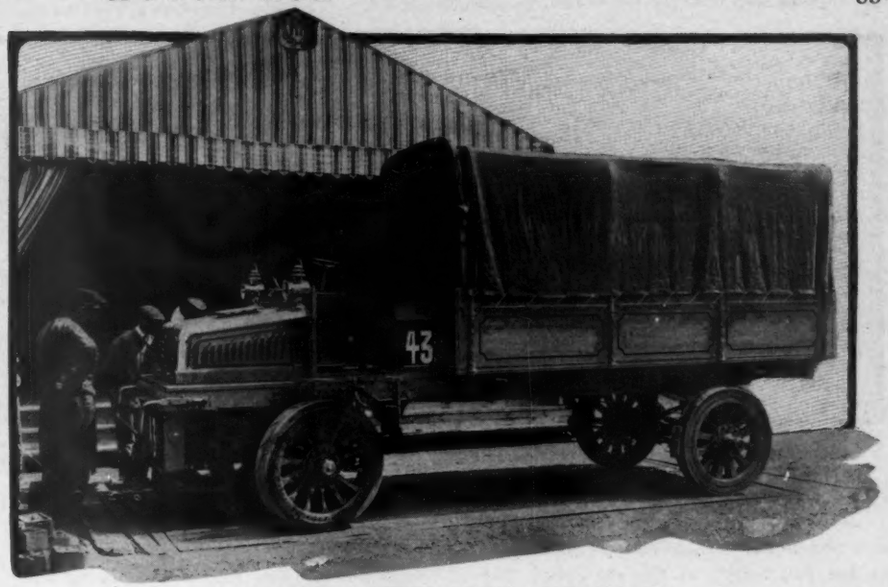
the conversion to steel tires, but in making the changes the firm has modified its truck so as to carry motor and gearbox on a subframe attached to the mainframe members through a series of coil springs. Subframes for motor and gearbox are general, the longitudinal type riveted to a couple of transverse members being the most general; a fewer number rivet the whole of the subframe to the side members, and an equally small number carry the motor on tranverse members.

Use Small Motors

The motors are generally of small size. The largest is an Aries of 5.1 by 5.5-inch bore and stroke; but this is an exception, and the great majority have less than 4 inches bore, while the smallest is a Bayard-Clement of only 3.1 by 4.7 inches bore and stroke for a truck taking a 2½-ton load. Other small ones are Vermorel, 3.1 by 5.1 inches; Latil, 3.3 by 5.5 inches; Delahaye, 3.3 by 5.1 inches; Renault, 3.5 by 5.5 inches; Berliet, 3.1 by 4.7 inches; Peugeot, 3.5 by 5.9 inches, and Malicet & Blin, 3.5 by 4.7 inches. In each of these cases the useful load is from 2½ to 3 tons.

Thermo-syphon water circulation and lubrication entirely under pressure or with a pump-driven circulating system are always adopted. Forced feed lubrication is indeed more general than thermo-syphon water circulation, although it is evident that as the pump is being dropped for the cooling system it is being taken up for the oil supply.

Without an exception ignition is by high-tension magneto only. Touring car practice is to have a fixed ignition point, but owing to the three fuels which have to be used in the competition a number of competitors have preferred to use a variable advance, thus allowing them to give a greater amount of ignition advance for benzol and alcohol than is necessary for gasoline. In the same way a number of the carbureters are fitted with a variable air inlet, or with a disposition for opening or closing the sleeve for the hot air intake. In some cases the jet or nozzle is changed with the fuel, being one-tenth bigger for alcohol and one-tenth smaller for benzol in relation to the one used for gasoline. There are other makers who run on one jet for all three fuels, merely having suitable arrangements for varying the heat and the air supply to the carbureter.

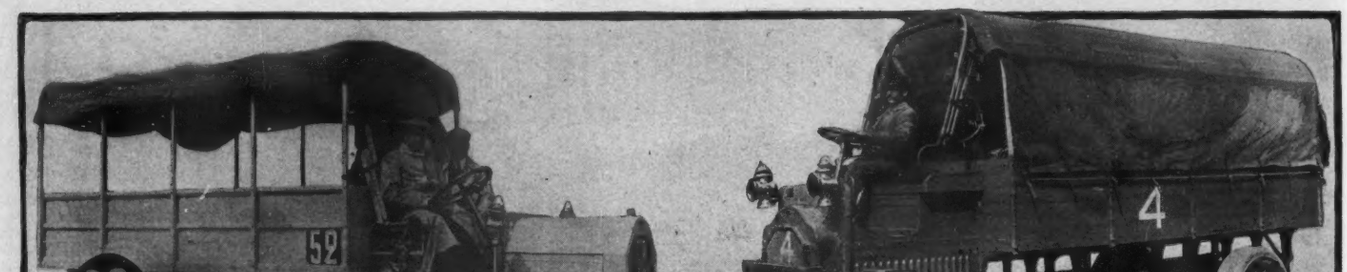


LATIL FRONT-WHEEL DRIVE ARMY TRUCK

Silent operation is not insisted on by the army authorities, yet it is noticeable that the motors emit no more sound than those employed on the best touring cars, and with a few exceptions the whole of the trucks were remarkably silent in operation.

One of the motors calling for special mention is a new model used on the front-drive Latil. The four cylinders of 3.3 by 5.5 inches bore and stroke are in one casting mounted on a bronze crankcase without a horizontal division dividing it into an upper and a lower half. This is the only use of bronze in place of aluminum in the competition, but there are several indications that French manufacturers are about to make use of this metal for crankcases, gearboxes, differential housings and other parts subjected to strain, particularly where the vehicles have to run on steel tires. On the Latil motor the valves are encased on one side, with intake and exhaust manifolds cast integrally with the cylinders, the latter being ribbed, while the former pass through the waterjacket, the carbureter being on the opposite side to the valves. The bottom of the crankchamber forms an alum-

FOUR-CYLINDER MONOBLOC MOTOR USED IN LATIL FRONT-DRIVE TRUCK



PEUGEOT TARPAULIN ARMY TRUCK DE DION MOTOR-OVER-AXLE TRUCK

inum pan about 3 inches in depth, extending the full length of the chamber. Naturally it has no connection with the bearings and on being taken away gives complete accessibility to the connecting rod ends. As there is no underpan, although the space between the sides of the motor and the frame are filled in, complete accessibility is obtained.

The magneto mounting is interesting. Carried on a platform to the rear of the timing gears, it is held down by a milled headed bolt B passing through a lug A cast with the cylinders, a semi-circular cap C being interposed between the top of the magneto and the end of the bolt. To dismount it tools are not required, and to put it back only a wrench is needed to tighten the lock nut on the bolt.

The oil pump, too, has the particularity of being carried within a bronze housing, the whole of the front of which is a hinged cover held by a single bolt and wing nut. The casing is on the side of the crankchamber below the frame member, with the drive taken from the camshaft to a cross shaft and from this by an external vertical spindle to the enclosed pump. The top of the casing containing the bevel gears, driving the oil pump, is designed to act as an oil filler. From the oil pump the lubricant is carried up to a sight indicator on the dash having a ribbed glass dial 4 inches in diameter, and from there to the main bearings and the troughs under each connecting rod end.

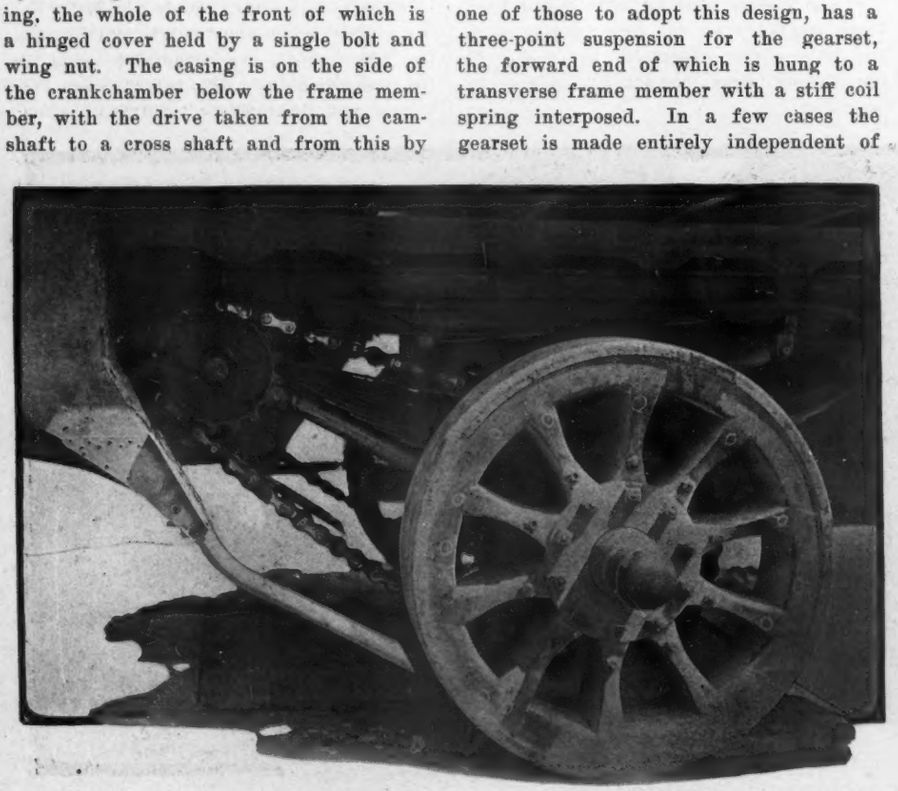
Shaft Vs. Chain Drive

Although shaft drive has made considerable progress for motor trucks, it is not yet in the majority. It can claim such firms as Renault, Bayard-Clement, Dietrich and de Dion, but it has against it Saurer, Peugeot, Aries, Berliet, Delauger-Clayette, Delahaye and Malicet & Blin. In most cases the gearset and differential are united in one housing, according to old-established practice. Berliet, who is one of those to adopt this design, has a three-point suspension for the gearset, the forward end of which is hung to a transverse frame member with a stiff coil spring interposed. In a few cases the gearset is made entirely independent of the differential, an example being found on the Bayard-Clement new 2½-ton truck. Here the motor and gearbox are carried on a longitudinal subframe having their ends riveted to two transverse members. There is a universal joint between the motor and the gearbox, and the latter is set as close to the motor as possible, and is directly under the foot boards. The motor, it may be mentioned, is carried under a Renault type of bonnet with plain tubular radiator on the dash. The design necessitates a well-fitting underpan, and in place of fins on the flywheel, as used by Renault, the Bayard-Clement method is to carry them on the brake drum at the rear of the gearbox. The power is carried rearwards through a propeller shaft to a countershaft, which is in reality a touring car rear axle with pinions instead of road wheels on the extremities of the driving shafts. As will be readily understood, this tends towards uniformity of the models, for the truck is built up with all the working parts of a touring car, even the rear axle being employed with its truss rod and only slightly modified sleeves. It must not be supposed, however, that this was a return to the old practice of trying to build a truck with a touring car chassis: the frame, final drive, road wheels and steering gear were all specially designed for the heavy work they had to perform. Coming from a firm with the experience of Bayard-Clement, the arrangement has its significance.

A device not found on any of the other trucks is a differential locking mechanism, to be used when desired to get the vehicle out of rough or soft ground. A similar arrangement of independent differential is on the two Vermorel trucks; other French firms not taking part in the army competition might be quoted as having adopted this design.

Winch Being Used

Saurer is the only one of the gasoline brigade making use of a trailer in addition to carrying a full load on the platform body. The truck itself is practically the latest 5-ton chassis specially



DEVICE FOR DELIVERING SAND ON PURREY STEAMER

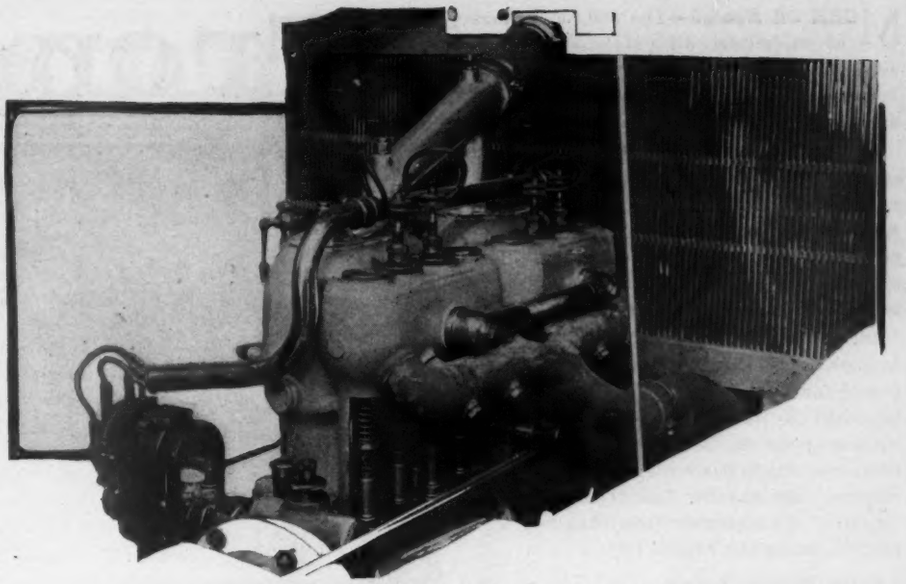
designed to receive a trailer also carrying a 5-ton load. In addition these models are fitted with a motor-operated winch mounted on a suitable platform at the extreme rear of the chassis and carried under the body, the space between the top of the frame members and the bottom of the body making this an ideal position. The winch drive is by means of propeller shaft and worm gearing from the four-speed gearset combined with the differential. A separate lever on the driver's left hand allows the winch to be put into engagement. Purrey, a Bordeaux firm specializing in steamers, also has two trucks with trailers.

Clearance Is Imperative

With one or two exceptions, the 12-inch clearance imposed by the army authorities is exceeded with a considerable margin. In examining this feature it was stipulated that the minimum clearance should always be observed for the steering gear connections; but the same severity was not maintained for the driving chains, and several cars are to be seen with an ample clearance with the exception of the driving chains, which are so near the ground that would quickly be in difficulties on many American roads. As the big clearance is insisted upon in order that the trucks may be capable of operating wherever army service vehicles can now be drawn, it is surprising that this point should have been overlooked.

The protection of mechanism is a remarkably good feature, and in this connection should be mentioned the new 22-horsepower Berliet, similar to the cars now being used by the P. L. M. Railway Co. over the new Alpine road. The motor is set high, with a really efficient and yet readily demountable underpan, and the steering gear and brake connections are all so high as to prevent the possibility of fouling anything on the road. Lubricators are fitted wherever they can be of value, and notably on the spring shackle bolts. On the Berliet and a few other cars each spring blade has a rib on its under side fitting into a corresponding groove on the face of the blade immediately below. This not only tends to prevent the leaves splaying out but forms a means of oiling the blades of the spring without jacking up the chassis to separate them.

It is stipulated by the army that the gasoline tank shall be so mounted as to prevent all possibility of fire, and with this object in view the Bayard-Clement truck has a sheet steel housing lined with asbestos all round the tank with an interval of 1 inch between the two. In nearly all cases the complication of pressure feed is avoided, the tank being either under the driver's seat, or, as in the case of the small Delahayes, neatly built into the dashboard. The army stipulation of a big plug in the base of each tank is also one that should be of value to private owners. It is particularly necessary in this case on account of the changes of fuel, but there are many occasions in civil service when it is valuable to be able to completely empty a tank without trouble.



SHOWING MAGNETO POSITION ON RENAULT TRUCK

Three Kinds of Fuel

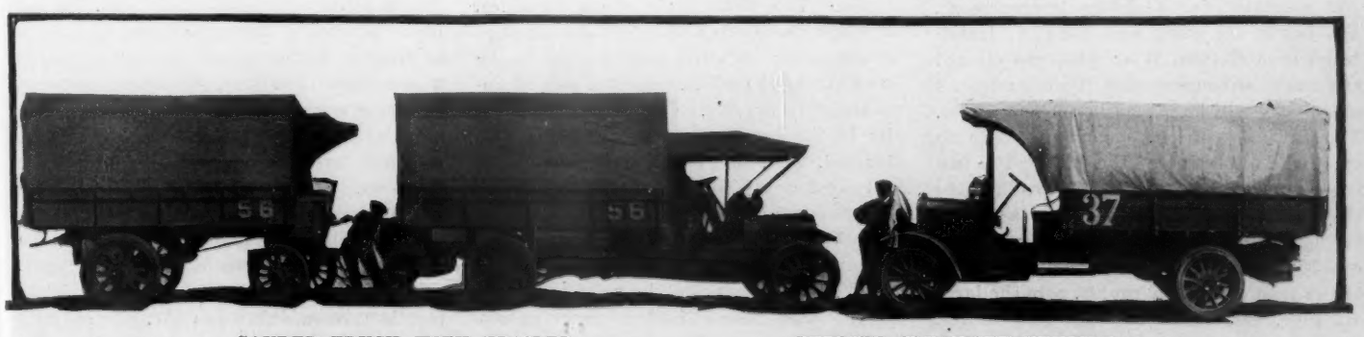
All fuel for the competition has to be obtained from a dealer in the open-air garage, and as an officer is always with the car on the road, it is impossible to obtain more in a secret manner. There are 4 days running on alcohol, 9 on benzol and the remainder on gasoline. Carburated alcohol—mixed with 50 per cent of benzol—is looked upon more as a fuel of the future than of the present. It has none of the disadvantages of benzol of pitting valves and valve seatings, but owing to restrictive legislation it is not readily procurable, and speculation maintains the price at an artificial level. For a considerable time the Paris General Omnibus Co. used alcohol exclusively, only abandoning it when the price became prohibitive.

Approved by General Bliss

General T. H. Bliss, United States Army, who has been in command of the provisional brigade at San Diego, Cal., has made a report of the test of a motor truck, a 2-ton Gramm type, purchased originally for use with the experimental rolling kitchen of the subsistence department.

The hauling capacity of the vehicle is 4,400 pounds, and during the maneuver work it amply proved its capacity without overworking and it performed the labor of three escort wagons. During its service, it handled nearly 1,000,000 pounds of subsistence stores and property, in addition to large quantities of supplies, such as beef, vegetables and flour, estimated at 500,000 pounds.

The authorities obtained some statistics concerning comparative cost expense of maintenance. The difference in first cost between the truck and three escort wagons, the latter with twelve mules, including the harness, is $664. The difference in cost of operation for 93 days is $372, both instances in favor of the truck. General Bliss believes the time is ripe for a motor truck specially designed for military service in this country.



SAURER TRUCK WITH TRAILER BERLIET CLEAN-CUT VEHICLE

MORE Oil Needed—The 300,000 gallons of asphaltum oil purchased by the city of Milwaukee for street oiling has been found insufficient and 140,000 gallons additional will be purchased at once.

Spends Fortune on Roads—The county court of Polk county, Ore., has made a record for itself in constructing permanent roads. This year about $100,000 will be spent on the roads of the county. The road between Falls City and Dallas, 9 miles, has recently been macadamized.

St. Louis Announces Test—The St. Louis-Kansas City reliability run, sanctioned for August, 14-19, has been officially launched by the sending out of entry blanks by the St. Louis Automobile Manufacturers' and Dealers' Association. At Kansas City the St. Louis entrants will be joined by motorists from that city and all will make the return trip.

Claim Electric Record—Joe M. Ward and R. L. Brouse have completed the Indiana four-states' tour in a Waverley electric roadster, and this is believed to establish a new mileage record for an electric car. It covered the whole route of 1,431.9 miles in 12 days with an actual running time of 128 hours. Considerable difficulty was experienced in many places in finding charging facilities, and for this reason the electric car could not keep up with the gasoline machines, finishing several days behind. On Thursday, July 13, the electric covered 157 miles.

Starts Roadwork—Work was commenced late last week on the Milwaukee-Chicago good roads project fostered by the Citizens' Business League of Milwaukee and other interests. The object is to improve and maintain an improved highway between the two cities. The Milwaukee road starts at the end of Layton boulevard, which is reached by the Twenty-seventh street viaduct, and the road selected for the work passes through Racine and Kenosha, Thomas Miners, a good roads expert from Rockford, Ill., is in charge of the work. The highway is being shaped with machines, the stones raked away and the holes filled with gravel and rolled. It will be dragged with a split-log hone after every rain.

Ready to Work—The new Wisconsin state highway commission, appointed under the law enacted by the last legislature to administrate an appropriation of $350,000 annually for highway improvement, has begun its work and John A. Haselwood of Jefferson, Wis., who was elected chairman, announces that the committee's machinery will be placed in action at once. The first act of the commission was to make the allotment of the fund. The law is so drawn that state aid is available to those counties which have voted a tax to build and improve roads in 1912, or those which do so vote before September 1, 1911. Milwaukee county, of course, gets the largest slice, $68,950, or 19.7 per cent of the total taxation. The county already has a large highway fund on hand and it is probable that during the coming year more than $250,000 will be spent for this purpose.

From the

ELGIN NATIONAL ROAD RACE
FRI. & SAT. AUG. 25-26
PRICES
PARKING PLACES ANYWHERE AROUND THE COURSE EXCEPTING
HOORNBEEK'S GROVE $2.00 HOORNBEEK'S GROVE $5.00
GENERAL ADMISSION - 50¢ TOP 3 ROWS IN GRAND STAND $1.50
BALANCE OF GRAND STAND $1.00 BOXES SEATING SIX - $15.00
VEHICLES - $2.00 TICKETS ON SALE AT FRED W. JENCKS OFFICE
ELGIN, ROOM 21 - THE SPURLING - CHICAGO, PHONE, 354 INTERSTATE 163
AND STEWARTS SPEEDOMETER SALES ROOMS 1312 MICH. AVE. CHICAGO PHONE CALUMET 3852

HUGE SIGN AT ELGIN ADVERTISING ROAD RACES

Club at Amery—The Amery Automobile Club has been organized at Amery, Wis., and S. L. Pennington has been elected president. The other officers are: Vice-president, H. B. Crommett; secretary and treasurer, George W. Miller; directors, E. J. Schneider, J. G. Burman and W. T. Kennedy. Although Amery is a small town, it ranks high in the number of motor cars owned by residents. The club will affiliate with the Wisconsin State Automobile Association.

Burman Meets Taft—Bob Burman has the distinction of being the first racing driver to be presented to President Taft at the White House. Last Thursday morning he was ushered into the presence of the president, who greeted him cordially, asking him many questions about his racing career. President Taft was particularly anxious to know how Burman kept the road when going at a high rate of speed. "I only guess at it," nonchalantly replied Burman.

New Maine Highway—Announcement that a new motor highway has been proposed between Jackman and Kineo, Me., has aroused much interest in Maine motor circles. The distance is about 40 miles, of which there are about 10 miles of road so the other 30 miles would have to be hewn out of the wilderness at a cost of approximately $50,000. If the state will assist in the expense the road will be constructed, and for natural attractions it will rival anything in America. At present the only approach to the famous Moosehead lake hunting regions is via Greenville, a route that is not at all popular. Jackman was first brought to public notice when the Glidden tour passed through there on its way back to this country from its Canadian pilgrimage. It has been much favored ever since, being on the direct route from Waterville to Quebec and Montreal through a most picturesque territory where the landscape is unbroken and for miles the highway follows the river.

Coast Records for Cole—By sending a Cole over the 318 miles between Los Angeles to San Diego, W. H. Carlson, of the Grundy Motor Sales Co., Cole distributor for southern California, a record for time of 8 hours 36 seconds was made, cutting down the record held by the Cadillac 14 minutes. Later the Cole ran from Los Angeles to Santa Barbara, 110 miles, in 2 hours 56 minutes, clipping off 12 minutes on the record formerly held by the Cadillac.

Making Unique Tour—Dr. and Mrs. H. C. Newton, of Chicago, in an original camping-dining-touring car, are at present on a motoring-camping trip of several thousand miles through the east and middle west. Dr. and Mrs. Newton left Chicago July 15, and will not return to their home until about September 1. Dr. and Mrs. Newton carry as equipment an alcohol stove with tin plates and cooking utensils. When meal time arrives during their travels, they stop and prepare the meal, which is placed on the front seat as a table, the diners sitting upon the rear seat. When night overtakes them the front seat back is dropped and over this surface is placed a pneumatic mattress, supported between the front seat and the dash by an arrangement of leather straps. About the car are fastened curtains with mosquito netting windows. Dr. Newton, being the last to retire, fastens these down about the car and then climbs in over the back seat. To guard against molestation or prying eyes, a burglar alarm, also devised by Dr. Newton, is thrown about the car. It consists of a trip cord placed in a circle about the

Four Winds

ELGIN AUTOMOBILE ROAD RACE COURSE
RACES FRIDAY & SATURDAY AUG. 25-26 1911
PRICES
PARKING PLACES ANYWHERE AROUND THE COURSE EXCEPTING HOORNBEEK'S GROVE $2.00
HOORNBEEK'S GROVE—$5.00 GENERAL ADMISSION—50¢
TOP THREE ROWS GRAND STAND—$1.00
BALANCE OF GRAND STAND—$1.00
BOXES, SEATING SIX—$15.00
VEHICLES—$2.00
PARKING AND GRAND STAND SEATS WILL BE ON SALE ON AND AFTER JULY 1ST 1911
FRED H. SMICK'S
OFFICE Elgin
ROOM 21
THE SPURLING
CHIC. PHONE 354
INTERSTATE-163
AND STEWART'S SPEDOMETER SALES ROOMS
1312 MICHIGAN AVE. CHICAGO ILL. PHONE CALUMET 3852

METHOD ADOPTED BY ELGIN TO BOOM ROAD RACES

car several inches from the ground and connected with an alarm clock, this latter being attached to the rear seat back near the heads of the sleepers. The slightest disturbance of this cord is sufficient to cause the alarm to signal. From Chicago Dr. and Mrs. Newton toured eastward through Cleveland, Buffalo, Syracuse and Albany to Boston. From there their route lies along the Atlantic coast to New York city, Atlantic City, Philadelphia, probably Washington, D. C., and thence westward toward home.

Not a Culprit After All—The Milwaukee-Oconomowoc Good Roads Association, which is improving the main highway from Milwaukee to the Waukesha county lake region, offered a reward of $25 for the apprehension of the culprit who strewed tacks and nails on the Blue Mound road near the Milwaukee Automobile Club's house. The man was caught, but it developed that he is a hardware dealer in a suburb and while taking home a load of goods lost a large box of tacks and shingle nails in bulk. There was, of course, no prosecution.

In Memory of John Anderson—The memory of John Anderson is to be perpetuated in the White mountains in a fitting manner. Plans are under way to improve the highway connecting Franconia and Crawford notches by widening it and making it better generally and then naming it Anderson boulevard. At each end of the road there will be tablets telling why the boulevard is so named, and patrols will be established to care for the highway. It will be a fitting memorial to the man who did more for the motorists of the country who sought New Hampshire as a state where it was a delight to visit, by arousing interest in highway maintenance and working hard for better roads. A committee has been appointed to carry out the work of building the proposed memorial and W. S. Kenney, who succeeded Mr. Anderson at Bretton Woods when the latter died, is chairman of it. Subscriptions are being secured and all motorists who have enjoyed touring in the White mountains are invited to co-operate with the work.

New Garage Precaution—The city of Eau Claire, Wis., is considering an ordinance requiring garage keepers to construct and maintain a ridge or stop across the entrances and exits, such stops to be not less than 6 inches high, 6 inches wide at the top and 12 inches wide at the bottom. The ordinance is to prevent accidents, it is stated.

Dead Horse Climb Next—The Dead Horse hill-climb, at Worcester, Mass., will be held August 12, under the auspices of the Worcester Automobile Club. Efforts are being made to put the 1-mile course, which has a grade averaging from 8.3 to 12.2 per cent, in shape so that record breaking will be possible. During the past week several new entries were made, among them being a couple of Simplex cars entered by amateur drivers. Negotiations are under way to secure Louis Disbrow to compete with his Pope Hummer.

Help the War Game—Much interest was manifested in the outcome of the war game played by the Massachusetts state militia at Lynnfield, Billerica and Wakefield because of the motoring angles. Three wireless stations flashed forth the latest news of the two armies in the field. This was the first time that wireless has ever been used by the militia in a war game. In addition to the wireless preparation, reels, carrying wires and instruments, on two Kisselkar 1-ton trucks were in operation and wires were strung along the road. The wireless system was entirely independent in the war game, inasmuch as the Kisselkars in this service were equipped with electric dynamo for generating the current supplied to the batteries for the wireless service. This arrangement was unique and was the first time such an arrangement had been on a motor car for wireless service in the United States.

Beach Meet for Maine—W. T. Kincaid has secured a sanction for a series of races on the beach at Old Orchard, Me., for Labor day. The beach is not as long as Ormond, but it is possible for a stretch of something like 3 miles to be used, and great speed may be attained over it. Old Orchard beach is within 3 hours' train ride of Boston.

Pontiac Wants a Club—Preliminary steps were taken at a recent meeting at Pontiac, Mich., for the organization of a club to be affiliated with the American Automobile Association and which will take an active part in the campaign for good roads. Robert C. Enos, of Grand Rapids, was present at the meeting and outlined plans for the organization of the new club. There are 200 owners in the city.

French Admire Wire Wheels—Following the light-car road race at Boulogne, in which detachable wire wheels played such a prominent part, a writer in le Monde Automobile, a Paris publication, declares that the French are slow, that it has remained for the English to demonstrate the utility of wire wheels. He predicts that many of the new models will be thus equipped.

Insurance for Chauffeurs—The Chauffeurs' Federation of America, of Utica, N. Y., has been founded for the purpose of giving the chauffeur accident and health insurance at a rate which he can afford; to give him legal protection when needed; to establish clubs and club rooms throughout the country for the use and betterments of the chauffeur while traveling; to reform laws which have been passed in various states which are overburdening chauffeurs in the way of taxes and licenses; and to finally establish a national organization where the chauffeur will come in contact with brother or brothers which will aid him in his travels.

No Sanction Required—From certain quarters there have come rumors that the Indiana four-state tour was an unsanctioned run, and being such rendered all participants, both entrants and drivers, liable to suspension. This is not so, the Hoosiers say. There was no sanction to the tour simply for the reason that none was required. There were no rules, no contest features and no prizes. Eliminating competition made a sanction unnecessary. It was simply a boosters' trip, in which every progressive car manufacturer in Indiana was represented. The matter of sanction was taken up with the A. A. A. over a month before the tour started. The entire plans were laid before Chairman S. M. Butler, of the American Automobile Association contest board. Mr. Butler then announced that a sanction was not necessary.

Manufacturers' Communications

WORKING ON A FRANKLIN WOOD FRAME

Building Wood Frames

SYRACUSE, N. Y.—Editor Motor Age—The manufacture of the wood frames on the Franklin cars is an interesting process, this company having continued to use wood frames, whereas practically all of the other makers use pressed steel ones. The wood used is carefully chosen and is second-growth ash secured from northern Pennsylvania. Second-growth wood is selected because it is of better grain than first-growth, having greater strength, resilience and of lighter weight.

After it is received at the factory it is stored for 2 years, and when well seasoned is cut into sill-shaped pieces at the factory. These pieces are then given a short kiln drying to increase the resilience and make them less susceptible to weather conditions. After this they are planed, some thinner than others.

Next they are sorted into groups, two thick sections and one thin section, the latter being the middle ply of the three-lamination sill. The outer layers are left thicker at this point, as there is yet more planing and trimming, which in the end leaves the three laminations the same thickness. These three sections are painted with glue and are fastened together with clamps applied in close proximity to each other.

The gluing is generally done late in the afternoon, and the clamps are allowed to remain in position until the following morning, allowing the glue to set. Then after more jointing and planing the sill is marked, band-sawed and shaped on a former. This leaves it the size desired for use. Being made of three layers of wood, precaution is taken lest water or the weather affect the serviceability of the pieces by working into the glued joints at the top and bottom. Along the top and bottom of each sill is fastened a strip of ash $\frac{1}{16}$ inch thick. The three laminations are next fastened together with screws, making the three-ply sill stronger than it would be were it a whole piece of the same size. The thickness of the completed sill is $1\frac{3}{4}$ inch.

To provide for the rear cross bar, the sills are put through a forming machine which cuts a right angle section from the rear end of each, permitting the insertion of the cross bar ends. Holes are next bored for the emergency brake band lever, and then the sill goes to its assembly.

Bench workmen, who perform this task, clean the sill and round up the top and bottom edges. The top corners are rounded with a radius of approximately $\frac{1}{16}$ inch and the bottom corners are rounded with a radius of $\frac{1}{8}$ inch. This is because the larger radius is more serviceable in its position, while the $\frac{1}{16}$ inch radius is more pleasing to the eye. The front end of each sill is covered with an aluminum cap. The rear corners are strengthened by a block 4 by 4 by $4\frac{1}{2}$ inches, glued and screwed inside the angle.

In assembling the forms the work is carried on a trestle. The floor boards, very small iron attachments, etc., are put in place here. Workmen are not troubled with measuring for the location of holes, all this being done with a templet.—H. H. Franklin Mfg. Co.

STEARNS' PRAISE OF KNIGHT

Cleveland, O.—Editor Motor Age—Ever since it was rumored that we would bring out a new model this year, utilizing the Silent Knight principle, I have been asked to write an article telling why we use the Knight. In the limited amount of space allowed I hardly know how best to go about it.

In the first place, we spent over 2 years in developing this engine, even though such great concerns as Daimler, Mercedes, Panhard and Minerva previously had admitted that the Knight was the world's best. Our long and interesting tests proved not only that these great European manufacturers were right, but that the motor was better even than claimed.

As a matter of fact, we found that the Stearns-Knight engine would perform better than anything before produced. It is not only absolutely silent and vibrationless, but its power increases as it gets older. The valves never need grinding either. In the Knight type engine, there is no dependence placed upon springs—every action is in accord with known mechanical laws.

Many people seem to think that the Stearns-Knight is a two-cycle engine. There absolutely is no connection in any way, shape or manner between the Knight type and the two-cycle. The Knight is just the same as ordinary engines, so far as the cycles are concerned. Its advantage over them lies in its greater power, silence, speed and flexibility.

I have several times been questioned concerning this extra power, and to settle all doubts I will make this positive statement: Our company guarantees 50 per cent more power than can be obtained in an ordinary engine of equal size. Power in the Stearns-Knight is not dependent

FRANKLIN FRAME MAKING—THREE SECTIONS PAINTED WITH GLUE AND FASTENED TOGETHER WITH CLAMPS

upon springs, cams, stems, etc. It is positive, and it increases as the engine gets older. That's the best feature of the motor.

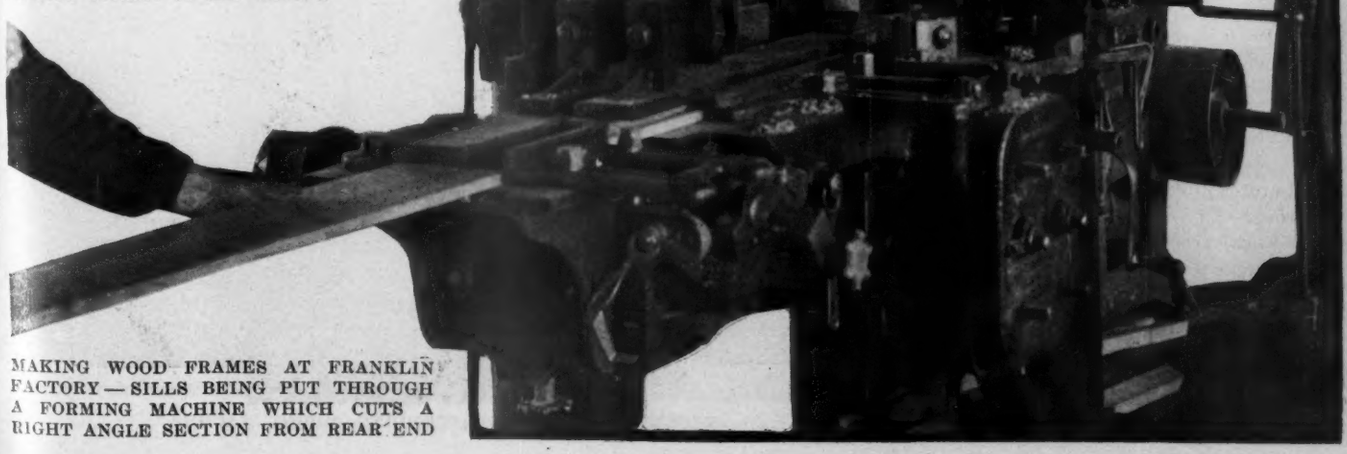
All timing gears are eliminated. This, together with the absence of cams, does away with all noise. The result is a noiseless engine with such power and speed that it cannot be compared with any other motor in any way.

In our own laboratories we have duplicated the wonderful test of the Knight motors by the Royal Automobile Club of England. This test was officially called the greatest engine test on record and it established so high a standard that no manufacturer of ordinary engines has ever dared attempt it. To try to equal it with other engines would be suicide, for it would be simply impossible. In the Royal club's test, the Knight motors delivered more power at the finish than at the beginning, and this test was harder than 2 years' actual service! Is it any wonder that mechanical engineers the world over are enthusiastic about this engine?—J. G. Sterling, Chief Engineer F. B. Stearns Co.

RUBBER OUTLOOK IN MEXICO

Torreon, Mexico, July 29—The guayule rubber industry is being seriously hampered and damaged by labor and political troubles that now are more general and of greater seriousness than during the period when the recent revolution was actually in progress. The factory of the Intercontinental Rubber Co. at Torreon is closed on acount of a strike of several hundred employes. The men demand an increase of wages which the company does not feel justified in giving. It is claimed that the factory employes of this company are already paid a higher scale of wages than is given by any other industrial concern in Mexico. None of the men receives less than $1 Mexican money per day, while the ruling wages in other factories range from 50 to 75 cents. It is announced that unless an early settlement of the strike is reached the factory will be kept closed until January 1, 1912, or longer.

Trouble is also being experienced upon the guayule lands with laborers employed in cutting the shrub, and the supply of raw products is rapidly becoming exhausted because of this trouble.



MAKING WOOD FRAMES AT FRANKLIN FACTORY — SILLS BEING PUT THROUGH A FORMING MACHINE WHICH CUTS A RIGHT ANGLE SECTION FROM REAR END

Touring In Europe

PARTICULARLY interesting to motorists planning a tour on the continent is the book "Seeing Europe by Automobile," by Lee Meriwether. The author took what he designates as a silver anniversary tour over the same route he traversed as a youth afoot on 50 cents a day. On this anniversary tour he is accompanied by his wife in the Get-There.

The trip, 5,080 miles in length, covered a period of 100 days, beginning at Havre, circling here and zigzagging there, first to Rouen and Paris, thence west to Trouville and St. Malo and Tours. Paris again and then Germany through Rheims, Munich, Nuremberg, and Frankfurt; Rheims to Lausanne, where a loop is made to Berne, Bellinzona, and Geneva; Geneva to Nice, Genoa, Pisa, Florence, Rome, and Naples, the destination. The author is a take-your-own-car advocate, claiming that it costs much less than to rent one. The shipping of the car across the ocean amounted to $530.28, or an average of $5.30 per day; this included boxing, ocean freight both ways, repairs, tires, gasoline, oil, etc. There are many other interesting figures and it is very evident throughout the book that the author and his companion aimed to get all the pleasure possible and do intensive sightseeing at a moderate cost, for he does not hesitate to say that their bill for a day was sometimes less than $1.50 each, and on an average was less than $4 for the two. Their car, though it had the appearance of a gypsy wagon, gave them a freedom and independence otherwise impossible, as they were able to carry plenty of clothing without the necessity of forwarding baggage by mail, and lunch baskets and vacuum bottles only added freedom and zest to the trip. An appendix gives a complete itinerary with mileages of the tour, and the book also contains valuable information about special equipment for touring, insurance, cost of gasoline and tires, etc. Baker and Taylor Co., New York. Price $2.

Hand Book for Motor Cyclists

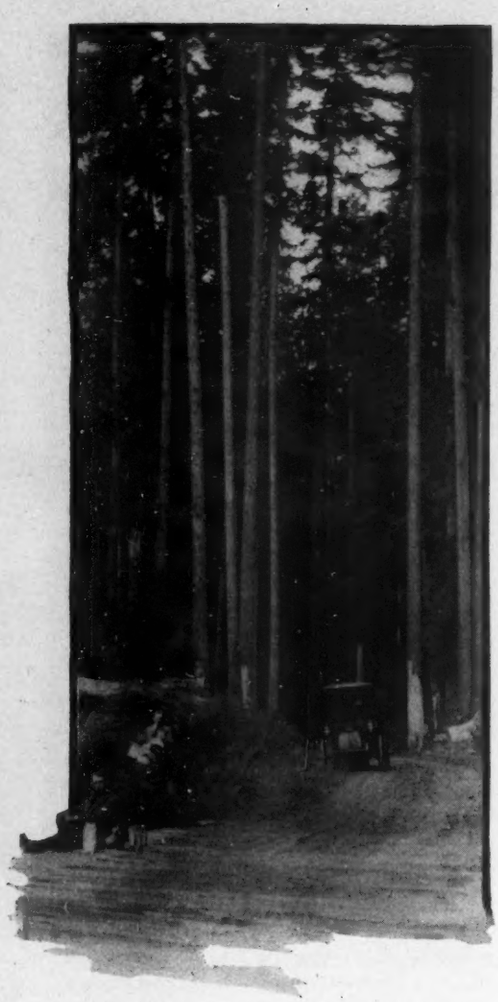
Dealing with the principles of construction and operation "The Motor Cyclist's Handbook," by Phoenix, should prove a useful book to adherents to this type of locomotion. Some of the chapter titles, of which there are fourteen, are: The engine, its working principle, the four-stroke cycle and the means of operating them; the two-stroke or valveless system; twin and four-cylinder cycle engines; constructional details of motor cycle engines; compression; the carbureter; ignition; overhauling; driving hints; cost of operation; equipment; and the legal aspect of these machines. Percival Marshall & Co., London, E. C., England.

Engineering Articles

The "Proceedings of the Session of 1909 and 1910" of the Incorporated Institution of Automobile Engineers, volume IV, is a compilation of the various papers read and discussed at the meetings of the society. Some of the subjects under discussion are: Pneumatic springs for road vehicles; chains for power transmission; forced lubrication, etc.

Reo in a Mountain Test

Light Delivery Wagon Makes Strenuous Trip



REO IN THE FOREST

ONE topic on motor row, Tacoma, is the endurance run of the Reo 1,500-pound light delivery car to Mount Tacoma, July 9 and 10. The car, loaded with 1,850 pounds of groceries, and carying H. E. Stimpson, Thomas Batte, and F. Kirby Haskell, correspondent for Motor Age, started at 4 a. m. Sunday, July 9, and taking the roadway over Pacific avenue hill, made good time to Fern Hill and Parkland, 8 miles away, in 45 minutes; thence to Bismarck, and from there straight through the forest, emerging at Ohop hill, a distance of 26 miles.

Crossing Ohop valley the real climb commenced, up the switchback road, cut from the solid rock hundreds of feet above the beautiful Nisqually river. For the next 10 miles the driver was required to give close attention to his car, as a turn in the wrong direction would have caused it to leave the road at some one of the sharp turns and be dashed in the Nisqually canyon 500 feet below.

The next stop was made in the heart of the forest a few miles from Elbe. Reaching Ashford about 12 o'clock, another short stop was made and upon inquiry it was found that the road between that point and Longmire was in very bad shape on account of numerous rains, and the tourists were advised to discontinue the trip, as it was predicted that they could not get through with the heavily loaded car. The worst roads on the trip were encountered during the next 10 miles, several times the car sinking to the hubs in the heavy mud. Careful and skilful driving won, and the car reached Longmire Springs at 2 p. m.

Between Ashford and Longmire Springs a stop was made at the government lodge, where a $5 toll was collected for the privilege of running over the government road, and opportunity given for registering in the government book. At this point, as well as elsewhere on the trip where stops were made, the residents were surprised to see a delivery car, as this was the first commercial wagon to make the trip to the mountain, and the run was also remarkable owing to the heavy load carried and the consideration of the roads.

Returning to Longmire Springs in the afternoon, the car was unloaded and left there for the night, the crew taking the trail for Reese's Camp, arriving there at 6 p. m., which is at a height of 7,000 feet above sea level. At 9:30 a. m. the following day the descent began. On reaching Rocky Creek on the return trip the tourists were pleased to find the new Tanwax bridge across this creek just completed, which makes a considerable saving in making the trip. Crossing the Ohop valley at a fast pace, the car took Ohop hill on high gear, and the balance of the trip was made in good time, the car arriving in Tacoma at 6 p. m.

An average of 12 miles an hour was registered in going, and from 13 to 15 miles an hour was made on the return trip. Approximately 12 gallons of gasoline were consumed on the round trip of 144 miles, and 1 gallon of lubricating oil.

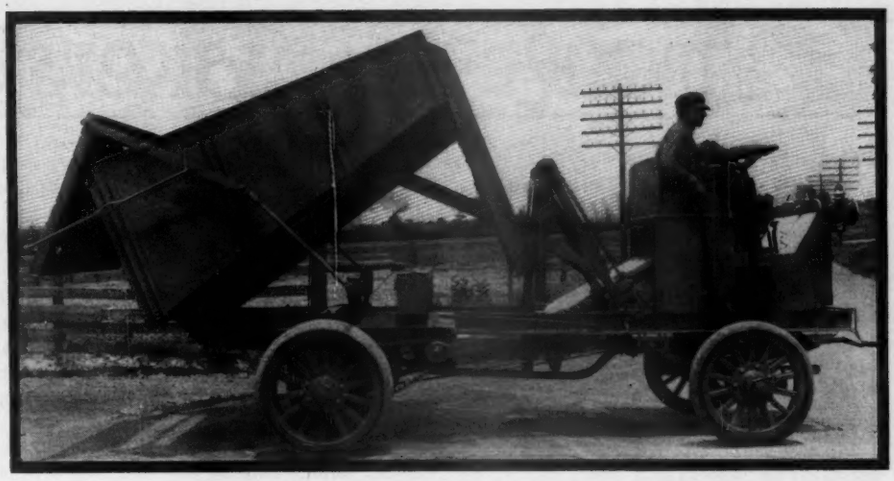
As a result of making the trip the Reo has established a record for delivery cars to Mt. Tacoma, being the first to make the trip. At no time on the trip was there a tool touched to the car, no mechanical trouble whatever being experienced, or adjustments made to any part of the car. Neither was it necessary to replenish the water supply in the radiator after starting from Tacoma.

The groceries carried from Tacoma on this trip to Mt. Tacoma were a shipment for the Harris Tourist Co., at Longmire Springs, and it was specified by the purchaser that they should be at this point before Monday morning, July 11. On account of the C. M. & P. S. Railroad being unable to guarantee delivery by that time the shippers were at a loss to find suitable conveyance until the light delivery truck was thought of.

SAND DUMPING TRUCK

One of the latest products of the Gramm Motor Car Co. is a truck equipped with an automatic dumping body to be used in conveying sand, gravel, crushed stone, etc. The chassis is built to carry a 6-ton load and the body has a capacity of 124 cubic feet. In normal position the bottom of the body has a slope of 15 degrees. The body can be raised another 25 degrees, giving a maximum slope of 40 degrees. The raising and dumping movement is accomplished through a set of gearing, actuated by the truck motor. At 1,000 revolutions per minute this 50-horsepower motor raises the body and load to its maximum height of 40 seconds. The control of the body-actuating mechanism consists in a single lever beside the driver's seat. By a single movement of this lever the body can be hoisted, dumped and the body lowered back to normal position automatically without the driver leaving his seat. The end gate, which is entirely auto-

TACOMA EXPEDITION ASCENDING MOUNT TACOMA



GRAMM 5-TON SAND-DUMPING TRUCK, MT. TACOMA

matic, opens as the body raises. Any size opening can be obtained and the load spread over a road to any depth desired.

In a test at the Gramm plant 7 tons of crushed stone were hauled over give-and-take country roads at 10 miles per hour, and at the conclusion of the trip the stone was automatically spread over the road at uniform depth. The big truck was constructed especially for the Defrain Sand Co., Philadelphia.

NEW YORK'S REQUIREMENTS

New York's special commission, which is seeking to motorize the fire department, is working on the theory that makeshifts are not economical and that the perfect fire-fighting apparatus should be a complete whole rather than an assemblage of a motor car and one of the various bodies useful in the work of the department.

In the past sets of specifications for both motor car and fire department body have been prepared without plans and drawings and bids have been asked from manufacturers. Some of the apparatus submitted has been good as a motor car and more of it has been good as fire apparatus, but experience has been plentiful to show that much of the mechanism tested has not proved to be satisfactory as motor fire apparatus.

Where specifications have been offered, the bidding has not been sufficiently general to afford the widest choice. The manufacturers of motor cars sometimes have been required to make unusual alterations in their stock models in order to come within the terms of the specifications, and of course were obliged to rely to a greater or less extent upon the manufacturers of fire apparatus for some of their equipment. The makers of fire apparatus naturally have an advantage in the bidding for bodies, but this is counteracted by the fact that they are not manufacturers of motor cars in a broad sense.

The situation, as it has now been developed, is that the fire department is looking for apparatus, driven by gasoline engines, that shall be symmetrical in service, utility and appearance. The result of a recent test showed that only one out of seven models submitted was able to answer the requirements, and some alterations were needed in the successful candidate before it could pass.

It is pointed out that only a small mileage is required of motor fire apparatus in the course of a year. This mileage must be accomplished at high speed and with the utmost certainty. While it is known that wear and tear on a motor car increase as the square of the velocity, the fact remains that fire apparatus has an immense amount of labor ready to be lavished upon it in its periods of rest.

For instance, in some of the outlying stations there are few calls in the course of a year, one a month being a liberal estimate. Now, during all the time except for the few hours or minutes in which the engine is fighting the flames, it stands in its house, the central object of the care and attention of a whole company. Thus it is a simple matter to maintain a motor fire engine in the highest notch of efficiency and the fire department, in buying such engines, does so in the belief that they will last for many years.

In a rough sort of way the life of a motor car may be measured in the miles it has traveled and it would take many years of average active service in the department to equal the mileage of the average pleasure car or truck. The trouble met with in the past has been that numerous makers are able to comply with the measurement requirements and that few of their products have been able to meet the service tests. It is the main object of the board to compile such a set of specifications that when the apparatus is submitted it will cover the ground of the practical tests.

REO LIGHT DELIVERY WAGON AFTER MAKING ITS MOUNTAIN CLIMB

Among the Makers

GUTHRIE Appointed—Tracy W. Guthrie has been appointed secretary and general manager of the Standard Welding Co., succeeding the late William S. Gorton.

United Motors Dividend—Holders of preferred stock of the United States Motor Co. will receive a quarterly dividend of 1¾ per cent on August 10, based on the returns to July 31, 1911.

May Open Oklahoma Factory—J. A. Swinehart has returned recently from Oklahoma City, Okla., where he will soon organize a company for the manufacture of motor car and motor cycle tires. He was favorably impressed with that location for a tire factory.

Hoosier Goes to Columbus—H. J. Schwartz, for some time vice-president and manager of the Meridian Auto Co., Indianapolis, agent for the Packard and Waverley, has gone to Columbus, O., to have charge of Packard sales in Columbus and adjoining territory.

Change in Axle Concern—F. L. Martin, who for the past 3 years has been secretary and sales manager for the Hartford Auto Parts Co., Hartford, Conn., has been made sales manager of the motor car axle department of the Sheldon Axle Co., Wilkes-Barre, Pa. W. J. Childs, the former sales manager, has resigned to become manager of the O. J. Childs Fire Extinguisher Co., Utica, N. Y.

Gramm Opens New York Branch—The Gramm Motor Co., of Lima, Ohio, which manufactures the Gramm motor truck, has established a branch in New York City under the name of the Gramm Motor Truck Co. The branch will act as sales agent for the output of the concern. It is planned to erect a $10,000 garage and sales room in New York. B. A. Gramm is secretary-treasurer of the New York corporation; F. E. Lamb is vice-president, and Charles Hector, of New York, president.

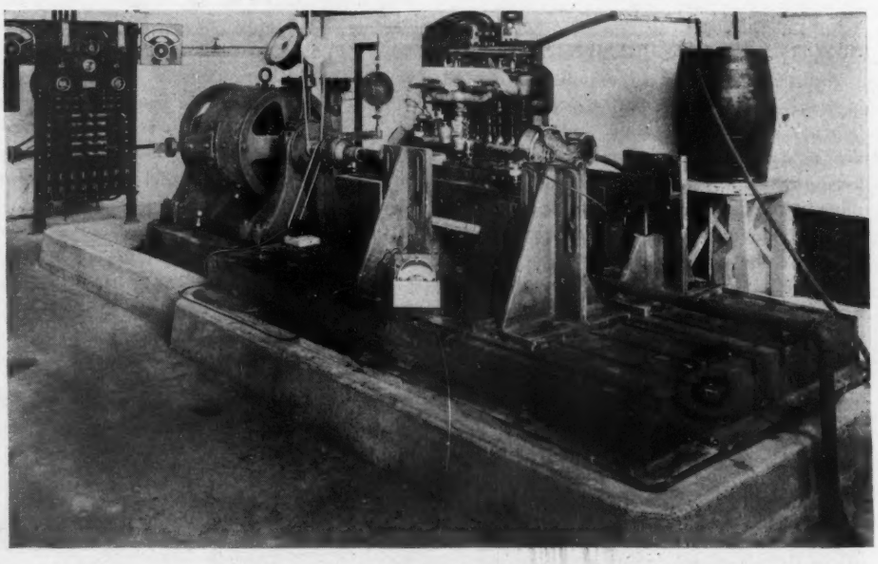
To Make Nateo Truck—The National Motor Truck Co. expects to begin the building of motor trucks in Bay City, Mich., October 1. The organization is the new body formed by the management of the National Cycle and Mfg. Co., which, after several years of investigation and many months of preparation, has decided to go into the motor truck business. The National Cycle and Mfg. Co., will continue as an independent corporation and will continue to manufacture the National bicycle, as well as motor. The new vehicle will be known as the Nateo truck. The company will manufacture its own motors and parts, the National Cycle and Mfg. Co. doing this part of the work. The capital invested is all local. Henry B. Smith will be president of the new company and F. C. Finkenstaedt will be secretary and treasurer. The men hold similar positions respectively with the National Cycle and Mfg. Co. The new factory will be located on the block bounded by Madison, Annie, Water and Sherman streets, the property being irregular in shape, 440 by 432 and 314 by 229 feet. The buildings will be devoted entirely to the building of the 1-ton truck or delivery wagon.

New Case Building Nearly Ready—The new administration building for the motor car department of the J. I. Case Threshing Machine Co., at Lakeside, Racine, Wis., will be ready for occupancy about September 1.

Lipman Building a Car—Carl Lipman, president of the Lipman Mfg. Co., Beloit, Wis., maker of centrifugal pumps, etc., has brought out a six-cylinder touring car built acording to his own specifications and for the most part in his own shops. It is highly probable that Mr. Lipman will organize a company to manufacture the car at Beloit. The six cylinders are cast in pairs and a feature of their construction is the fact that the dome is removable, for ready access to the combustion chamber and the valve mechanism. Ignition is by a high-tension magneto; cooling by a Lipman centrifugal pump, and the car is supplied with a self-starting device of Mr. Lipman's own invention.

Death of Prescott Adamson—Prescott Adamson, president of the Adamson Automobile Co., Inc., of Philadelphia, local distributer of the Reo car, died Saturday morning at his residence, 69 East Logan street, Germantown. Mr. Adamson was for years a prominent figure in Philadelphia motor circles and in the club life of the city.

Rambler Wins a Case—The Thomas B. Jeffery Co., Ramble manufacturer, Kenosha, Wis., has just collected probably the largest judgment ever awarded by a Wisconsin court. The amount is $133,000 and costs, amounting in all to $170,000, and the Chicago-Milwaukee Electric Railway Co. is the payor. The judgment is the result of the condemnation of land of exceptional value in the middle of the Jef-



WHEELER & SCHEBLER TESTING LABORATORY

A TESTING laboratory for testing gasoline motors of various types has just been installed by Wheeler & Schebler, Indianapolis, Ind., manufacturers of the Schebler carbureter. The laboratory consists of a dynamometer room, with test block for large motors, and fan test for smaller ones, and a refrigerating plant in connection for temperature tests. This laboratory is in a separate building adjoining the factory, and is fully equipped with large exhaust fans, and improved ventilating devices.

The dynamometer, which was manufactured by the Diehl Mfg. Co., of Elizabethport, N. J., has a capacity from 0 to 120 horsepower, and has a special grid or load-absorbing device, which removes all chance for errors, it is claimed. The motor exerts a direct pull by means of balance levers on a direct reading spring balance, which determines the torque or pull.

In connection with the dynamometer is a centrifugal and electrical tachometer for speed revolutions, one being a check against the other. A Veeder counter or odometer is attached to the shaft, giving the revolutions per minute. A watt meter is also included, giving instantaneous and accurate horsepower readings at the various speeds. A manometer is used for determining the vacuum on the carbureter, and thus showing whether the proper size carbureter is being used on the motor under test.

With these instruments a double check is obtained by measuring the volts and amperes as against the revolutions and pull, thus eliminating any possibility of

and Dealers

fery tract at Kenosha for a right-of-way. The case has been in the courts 6 years.

Get Lower Freight Rates—Milwaukee manufacturers of motors and parts have won a decided victory before the interstate commerce commission in the matter of their complaint against freight rates to the Facific coast. The railroads have been ordered to substitute for the present rate one not in excess or fourth class, based on a minimum carload rate not in excess of 24,000 pounds.

Invading the East—W. H. McMaster, manager of the Alfred C. Stewart Machine Works, Los Angeles, Cal., has started east in the interest of the Stewart Precision carbureter and the Stewart gas-saver. Mr. McMaster will establish headquarters for the central west either in Chicago or Detroit and will arrange for the manufacture of several thousand Stewart carbureters and Stewart gas-savers to supply the needs of that section. He will also visit points in Wisconsin, St. Louis and may possibly extend his trip to New York, which is headquarters of the Stewart accessories in eastern territory.

Joins Croxton Staff—George S. Patterson, formerly branch manager of the Thomas B. Jeffery Co., has been elected general sales manager of the New Croxton Motor Co., of Cleveland, Ohio, and will take charge of the sales of the company.

Terre Haute Claims Record—The city of Terre Haute, Ind., which has about 50,000 population, claims the Indiana record for motor car sales during the 1911 season. Motor car dealers of Terre Haute say they have sold 500 machines since January 1 and that the average price paid was $1,200.

Strout Joins Grabowsky—George H. Strout, for 4 years sales manager for the Apperson Brothers Automobile Co., Kokomo, Ind., has left that position to become eastern sales representative of the Grabowsky Power Wagon Co., of Detroit. His territory includes New York, New England, Pennsylvania, Delaware, New Jersey and the District of Columbia; and his headquarters will be at 316 West Forty-eighth street, New York.

Lowe Quits Fal Company—E. H. Lowe has resigned as secretary and general manager of the Fal Motor Co., of Chicago, and has gone on a long tour through Maine and Connecticut. W. B. Paulson suceeds Mr. Lowe as secretary, while President E. H. Marhoefer will act as general manager.

Olds Denies Rumor—R. E. Olds, president of the Reo company, who owns a controlling share in the stock, left last Thursday for Alaska, where he will spend a month with his family on a pleasure trip. Mr. Olds denied before leaving that he was about to sell out his interest in the Reo company.

Dniner for Four-Staters—Frank E. Smith of the Maxwell-Briscoe Motor Co., Newcastle, and who was general chairman of the Indiana four-states tour, has invited those who made the trip to be his guests on Sunday, August 6. Mr. Smith has arranged for a picnic on a farm near Newcastle.

Death of Chicago Dealer—Harry M. Burnell, vice-president and general manager of the Western Motor Co., of Chicago, agent for the Stearns, died suddenly Monday night of heart disease. Mr. Burnell had represented the Stearns in Chicago for 4 years. Formerly he was identified with the White Co. The remains were taken to Benton Harbor, Mich, for burial. Mr. Burnell leaves a widow, but no children.

Charley and Charron Combine—Ferdinand Charron, one of the founders of the C. G. V. Co., of Charror, Limited, a French concern, and son-in-law of M. Adolphe Clement, is about to found a motor car company in his own name in connection with C. L. Charley. The Charron-Charley Co. has been formed with a capital of $530,000, divided into shares of $20 each. The company intends to produce two models, either of which may be fitted with the Hanriot valveless motor or the standard type of poppet motor.

Bosch Service System—The Bosch Magneto Co. is now introducing throughout the country an extensive service system through which users of its apparatus wherever they may be located will be able to secure skilled assistance. The plan includes the appointment throughout the country of official distributors who will have a complete stock of repair and spare parts for Bosch apparatus, as well as a completely equipped repair shop in charge of a mechanic especially trained for the work. The distributors will furthermore be in a position to handle sales of Bosch products to the local trade. Each distributor, as appointed, will be furnished with an enameled sign featuring the Bosch magneto. Distributors are now being appointed and it is expected before many months have passed they will be operating in many parts of the United States and Canada.

WHEELER & SCHEBLER REFRIGERATING ROOM

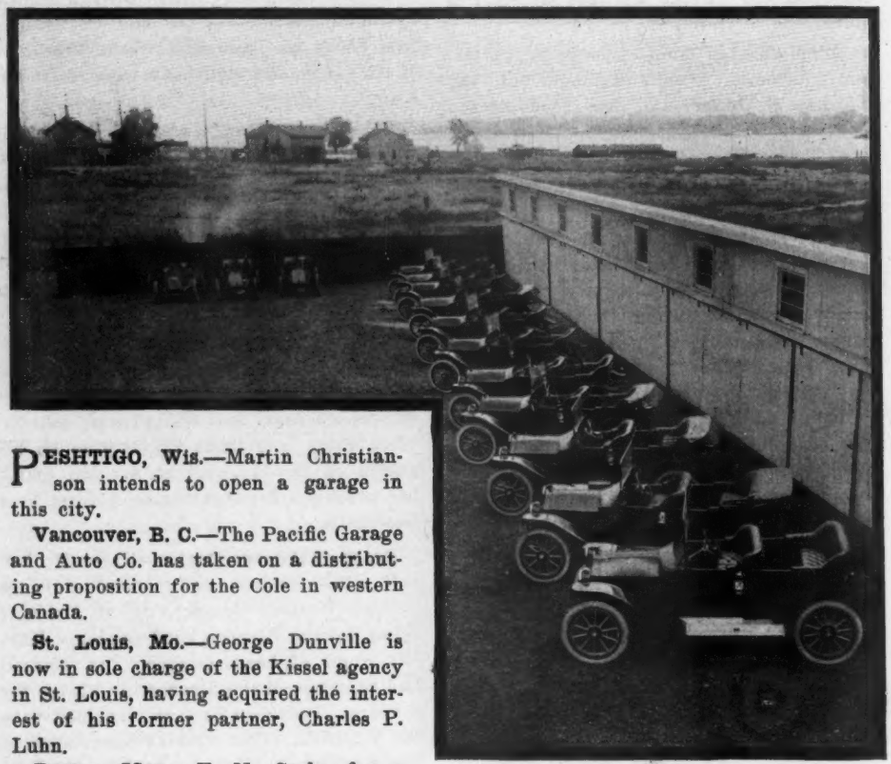
errors in results. The water circulation is so arranged that any given temperature can be maintained under any condition, and thermometers give the temperature of the intake and exhaust water circulation. A barometer gives the atmospheric conditions.

Weighing scales for fuel with electrical instruments to measure the fuel consumption at all speeds in connection with a stop-watch insures accuracy in this branch of the tests. A pyrometer is used for measuring temperature of the exhaust, and there is a gas analysis apparatus for analyzing the properties of the exhaust gases; an air meter for showing the amount of air used, which in connection with the gas consumption, will enable a gasoline and air chart to be prepared showing proportions used at all speeds and a special fan and load absorber for motor cycle and small motors giving S. A. E. readings.

The refrigerating room is located directly adjoining the dynamometer room, and a road-testing machine has been installed in this cold room. This road-testing machine is bolted to the dynamometer so readings can be taken from the drive exerted by the rear wheels of the car in the refrigerating room, if desired. A temperature of zero can be reached in a short space of time.

The refrigerating plant will be of great value in making actual tests under the most severe winter conditions, with different grades of fuel, and will demonstrate the results that can be obtained by various methods of applying heat to motors, manifolds, carbureters, etc.

Brief Business Announcements



FIRST BATCH OF THE 1912 KINGS

PESHTIGO, Wis.—Martin Christianson intends to open a garage in this city.

Vancouver, B. C.—The Pacific Garage and Auto Co. has taken on a distributing proposition for the Cole in western Canada.

St. Louis, Mo.—George Dunville is now in sole charge of the Kissel agency in St. Louis, having acquired the interest of his former partner, Charles P. Luhn.

Boston, Mass.—F. N. Carle, for a number of years connected with the Shumway Advertising Co., has resigned to acept a position as publicity manager for the General Vehicle Co.

Menasha, Wis.—C. E. Pierce and Phillip Heup have been appointed district agents for the Chalmers line. Temporary headquarters have been established in the Menasha Automobile Co.'s garage.

Louisville, Ky.—By amended articles of incorporation filed the name of Marshall Clark Motor Car Co. was changed to the Clark Motor Car Co. The articles are signed G. S. Clark, C. R. Culley, S. W. Clark and Ernest Coffman.

Dallas, Texas—J. O. Wharton has resigned his position as assistant branch manager of the Studebaker Brothers Co. of Texas to acept the position of district manager for the Willys-Overland Co., with headquarters at Dallas.

Boston, Mass.—Governor Eugene N. Foss, of Massachusetts, is going to erect three more buildings on his land on Beacon street, Boston, for motor homes, at 642 to 660 Beacon street. Already the Premier company has leased the middle one, and one of the big tire companies contemplates moving into the other. The third lease has not been taken up yet, but it will be shortly. There will be a total frontage of 100 feet on Beacon street and the depth will be about 110 feet, leaving a passageway 30 feet wide in the rear. Each building will have approximately 22,000 square feet floor space. The buildings will be five stories, the lower floors being for salesrooms, the next for offices and the upper floors for general garage or storage purposes, as the tenants need.

Matawan, N. J.—The Munning-Loeb Co., devoted to the design and manufacture of electro-plating and buffing equipment and supplies, has been formed by A. P. Munning and W. L. Loeb.

Toledo, Ia.—The Jones Brothers Auto Co. has been formed by Harvey Jones and F. C. Jones, who have built a first-class fireproof garage 75 by 65. They handle the Hudson and Maytag lines.

Boston, Mass.—Charles Addison Malley, former legislator, has once more embarked in the motor industry. He has taken the agency for the Warren car and has opened salesrooms on Boyleston street.

New York—The Bergdoll Motor Car Co. opened a branch last week on Broadway. The new salesrooms are the ones formerly occupied by the Hudson people. A. E. Schwartz is in charge of the branch.

Indianapolis, Ind. — Several agency changes are being made in Indianapolis preliminary to the opening of the 1912 season. Charles G. Sanders, formerly of Columbus, has taken the state agency for the Oakland. The State Automobile Co. has become distributor in Indiana for the Marion, succeeding the agency held by the Gibson Automobile Co., and the Indiana Automobile Co. has taken the agency for the Penn for the states of Indiana, Illinois and Kentucky.

Portland, Ore.—The Carter Car Sales Co. has moved from the Wemme building to 35 and 37 Stevens street. J. C. Hess has accepted the managership of this concern.

Minneapolis, Minn.—The Plant Rubber Co., of Minneapolis, has become a jobber of accessories. This concern has been a large dealer in accessories for some time, but only recently has taken to jobbing them.

Chicago — The local Pope-Hartford agency has been changed. James L. Russell, of Boston, has taken it on and has opened at 1714 Michigan avenue. Joseph B. Deibler, former Pope agent, is handling the Lion.

Portland, Ore.—The Stoddard-Dayton Automobile Co. is to have a new home, a three-story building to be erected for that company at Twenty-first and Washington streets. It is expected to be completed by January 1.

Kansas City, Mo.—A. L. Martin has joined forces with the Cole Motor Co, of Kansas City. Mr. Martin resigned his position as general manager of the Southern Motor Sales Co., Louisville, Ky., distributor of Cole 30-40 cars, to join the western company.

North Adams, Mass.—The Dunham-Peck Mfg. Co., of Goversville, has decided to locate in Pittsfield. It will build a factory 32 by 100 feet and with an ell 60 feet long. The firm manufactures machines of its own invention as well as motor car supplies.

Long Beach, Cal.—A contract to erect a two-story and basement brick building on Third street, between Pine and Locust avenues, has been awarded. The basement and first story will be used for garage purposes by the Electric Auto Co., which is putting up the building.

Mount Carmel, Ill.—The Manley-Wilkins Co. has leased ground and will begin immediately the construction of a garage and machine shop. The concern will handle a complete line of supplies and accessories. The building will be constructed of concrete and steel, 44 by 200 feet.

Pontiac, Mich.—The General Motors Co. has transferred the headquarters of the sales department of the Rapid Motor Co., of this city, from the local factory to Detroit. T. P. Myers, who is sales agent for the company, will have the same position at Detroit.

Louisville, Ky.—The E-M-F, Flanders and Pierce-Arrow will be sold in this territory hereafter by the Glenn-Bauer Motor Car Co. This concern occupies the building at Fourth avenue and York street, which formerly was used as a salesroom by the Studebaker Auto Co. Only a

wholesale depot, with W. W. Beeson in charge, is now maintained in this city by the Studebaker corporation.

Washington, D. C.—Extensive improvements to cost $5,000 are being made to the branch store of the Buick Motor Co., 1028 Connecticut avenue.

Madison, Wis.—The Ryan garage, 209 West Main street, has been appointed district agent for the Liberty-Brush and has placed its order for 100 cars.

Two Rivers, Wis.—The Standard Aluminum Co. will erect at once a new factory building, to be 200 by 44 feet in size, three stories high. The company is doing considerable motor car appliance work.

Cincinnati, Ohio—The Cincinnati Motor Car Co., has closed contracts for additions to its garages on Seventh avenue and Main street that will involve an expenditure of $100,000. For 90 feet back on Seventh street a three-story addition is to be erected that will be an exact duplicate of its present quarters.

New York—Negotiations have just been closed by which Long Island City is to get another important manufactory, the Benz Auto Import Co., now located at West Fifty-fourth street, Manhattan. The company has leased the first and second floors of the Galvin building, at Fourteenth street and the boulevard, owned and occupied in part by John F. Galvin, who a year ago moved his extensive business to Long Island City.

Cleveland, Ohio—By a real estate transfer, the Cleveland Taxicab Co. purchased from O. I. Leisy a tract of land on Fairmount avenue N. E. A new garage is to be built on the property. The land cost $20,000 and the new garage will necessitate an expenditure of $30,000. The property has a 100-foot frontage and is 90 feet deep. There will be a floor area of 22,000 square feet. Reinforced concrete is the building material to be used throughout.

NEW QUARTERS OF THOMAS BRANCH IN NEW YORK CITY

Recent Motor Incorporations

Augusta, Me.—Bernston Spring Wheel Co.; capital, $2,000,000; to manufacture, sell, buy and deal in wheels for motor cars, etc. President and treasurer, A. M. Leavitt, Augusta.

Boston, Mass.—Malley Motor Vehicle Co.; capital, $50,000; to manufacture motor cars. President, C. A. Malley; treasurer, M. R. Hatch, Boston.

Boston, Mass.—Motor Car Co.; capital, $25,000; to deal in motor cars; incorporators, William H. Vinal, Brookline; Samuel S. Anderson, Boston; Emma R. Anderson, Boston.

Chicago—Edison Storage Battery Garage Co.; capital, $5,000; to do garage business; incorporators, W. C. Anderson, Wilson Critzer, Frank E. Price.

New York—Eureka Safety Crank Co.; capital, $50,000; to manufacture safety cranks for motors and engines; incorporators, L. Bartlett, Englewood, N. J.; G. W. Peck, New York city; S. L. Bevan, Orangeburg.

BOSCH'S NEW SERVICE SIGN

Philadelphia, Pa.—Belt Cushion Tire Co.; capital, $1,800,000; to engage in the manufacture of motor vehices and their equipment accessories and to manufacture certain patents.

Philadelphia, Pa.—Philadelphia Motor Co.; capital, $100,000; incorporators, J. F. Green, Philadelphia, Pa.; J. L. Wolcott, H. R. Martindale, Dover.

New York—G. B. Garage Co. of Hempstead; capital, $10,000; directors, George P. Bowdren, of Hempstead, and George C. Bouthinson and George M. Bishop, of Garden City.

Warwarsing, N. Y.—International Fritchie Co.; capital, $500,000; to manufacture motor vehicles, etc.; incorporators, D. O'Connor, A. Sheard, H. A. Fluckinger, New York city.

Warwarsing, N. Y.—New York Fritchie Co.; capital, $200,000; to deal in all kinds of motor vehicles, etc.; incorporators, D. O'Connor, A. Sheard, H. A. Fluckinger, New York city.

Buffalo, N. Y.—McCue Co.; capital, $700,000; to manufacture electric, gasoline and steam vehicles; incorporators, J. W. Lansing, I. T. Gleason, B. H. Bean, H. A. Kamman, Buffalo; C. T. McCue, Hartford.

Buffalo, N. Y.—A. B. Gould Co.; capital, $15,000; to deal in sight-seeing motor cars, etc.; incorporators, Albert B. Gould, Ella G. Gould, Frederick A. Gould, all of Buffalo, N. Y.

Elmira, N. Y.—American Standard Autocar Lift Co.; capital, $25,000; to manufacture device for supporting wheels of motor cars, motor vehicles, etc.; incorporators, Ralph Webster, Dr. Merton E. Saefuse, Parker C. Thompson.

Elmira, N. Y.—La France Garage Co.; capital, $30,000; garage and to deal in motor cars, etc.; incorporators, A. W. La France, C. T. La France, A. W. La France, Elmira, N. Y.

Camden, N. J.—City Electric Omnibus Co.; capital, $500,000; to manufacture electric passenger buses and vehicles, etc.; incorporators, F. R. Hansell, John A. MacPeak, I. C. Clow, all as above.

Cleveland, O.—A. R. Davis Motor Car Co.; capital, $10,000; to manufacture motor cars and motor car accessories and parts and to carry on a garage business; incorporators, Charles A. Rolfe, F. H. Grace, George V. Gunderman, C. A. Lemmon and J. K. Kirkpatrick.

Toledo, O.—Willys-Garford Sales Co.; capital, $10,000; to sell motor cars and motor trucks and do a general garage business; incorporators, John N. Willys, G. W. Bennett, Walter Stewart, A. H. Smith and Rathburn Fuller.

Cincinnati, O.—Guarantee Automobile Co.; capital, $10,000; to operate a garage and renting business and to sell supplies for motor cars; incorporators, Joseph Berning, H. C. Wendell, W. H. Jones, George A. Berning and Herman Kirschner.

Dayton, O.—Gem City Liquid Vulcanizer Co.; capital, $20,000; to manufacture and sell vulcanizing fluids for the repair of motor car tires; incorporators, Brent S. Eshelman, Harry Isreal, Charles M. Myer, Wilbur E. White and Clarence J. Hanold.

Dayton, O.—Cadillac Motor Co.; capital, $30,000; to buy and trade in motor cars and accessories and operate a sales agency; incorporators, William Stroop, H. C. Hanning, L. G. Bowers, H. M. McCord and William M. Mathews.

Toledo, O.—Toledo Mfg. and Supply Co.; capital, $10,000; to manufacture motor car accessories among other things; incorporators, Sigmond Sanger, Trude Wooster, K. A. Kaley, George P. Hahn and Fred W. Widmaier.

Muskogee, Okla.—Roberts Motor Car Co.; capital, $5,000; incorporators, A. B. Roberts, J. V. Thomas and E. J. Phelps.

Petersburg, Ind.—Pike County Racing Association; capital, $3,500; to conduct race meets; incorporator, F. E. Alexander.

Covington, Ky.—Auto Fast Delivery Co.; capital, $1,500; to do a motor car transfer and livery business; incorporator, W. E. Bilsland.

The Motor Car Repair Shop

Hints to the Amateur

ONE of the most common causes of misfiring and consequent loss of power, is poor compression; still there are thousands of motorists who never dream of testing the compression of their motors when trouble of the above mentioned nature occurs. This should not be, for the compression is much easier to test than the carbureter, or the ignition apparatus. To test the compression of a motor, one has but to crank it slowly and note the comparative resistance of each cylinder and the resistance of all in general. If resistance or compression of one or more cylinders is comparatively poor, under ordinary conditions, the valves of those cylinders need grinding; if the resistance of all the cylinders is not up to the regular standard, then, perhaps all require grinding. A leak through one or more valves is generally accompanied by misfiring and loss of power; a slight leak through all of the valves is accompanied by loss of power but often without misfiring.

Think Then Act

When a motor begins to misfire suddenly from some unknown cause, the first thing a driver should do, should be to note whether the misfiring is regular, that is, if it occurs in only one or two cylinders at regular intervals in the cycle of explosions; or if it is intermittent in one cylinder or apparently in different cylinders. A regular misfire in one cylinder, that is, misfiring that occurs once at the same time in every cycle of the motor, generally is caused by a defective plug or a disconnected secondary or high-tension terminal. A defective valve also is probable. Intermittent misfiring in one cylinder may be due to a defective plug, or loose terminal connection, or a valve that is not closing tightly. Carbureter trouble generally is accompanied by popping and backfiring in the carbureter.

Of course, there are many other causes of motor misfiring, but the object of these suggestions is to impress upon the reader, the necessity of a little forethought in dealing with motor troubles. Always try to figure out the possible cause of the trouble before looking for it. Never change an adjustment without knowing why the change is made, the effect the change should make, and how to restore the mechanism to its original adjustment.

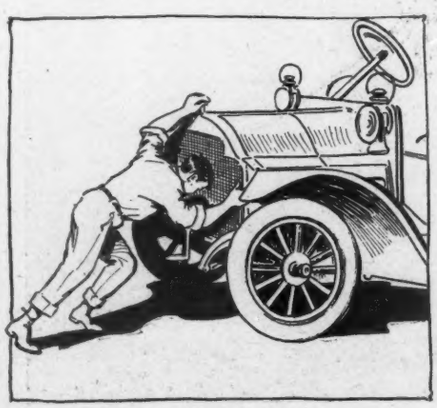
When the possible cause of trouble can not be imagined, then begin with a careful examination of all features of the motor that are apt to give rise to the trouble. If nothing is found out of order, then begin testing out the various features, beginning with the easiest and most accessible, and thoroughly complete each test before starting on another possible cause.

As an example of how a very little thing spoiled an evening for a party of motorists, caused the driver of the car much perplexity, and weakened the owner's confidence in his driver, the following episode should be of value. The owner had given his driver orders to have the car put into good shape for a certain evening. Plenty of time was allowed, so the valves were ground, the spark plugs of the make-and-brake ignition system cleaned and adjusted, the oil was drained from the motor, and a fresh supply put in; all ignition wires and connections were inspected, and all parts of the car were inspected, adjusted and oiled. Then the car was taken out for a little run to make sure that everything was running sweetly and ready to give good service.

When the motoring party started out on the evening, everything ran smoothly until after a run of several miles and a stop had been made for an hour or so. When the motor was restarted, the throttle was raised a little higher than usual and the motor raced for a few seconds before the throttle could be retarded. On retarding the throttle an unusual misfiring occurred. Not wishing to delay the party, and believing the motor would right itself in a minute or so, another start was made. The motor hardly had power enough to drive the car, and it became necessary to stop the car, though the engine was left running.

The Trouble Found

The hood was raised, but everything seemed in good order, the ignition mechanisms all seemed to be working properly, the carbureter adjustment was changed and then brought back to its original adjustment without any apparent improvement; then the motor was stopped and the make-and-brake spark plugs removed and found to be in good shape. The driver had tested everything that he could think of and then turned to the owner and suggested that the party take the street car,



DON'T DO THIS

which they did. The driver then repeated the tests he had made, but with no better results. A group of spectators had gathered around, among whom were several taxicab drivers who sympathized with the driver by cursing the make-and-break ignition system employed. One of the onlookers who had been watching the operations from the start, then asked the driver if he had tested the compression. He had not, and proceeded to do so immediately. One of the four cylinders was absolutely dead, so to speak; it had no compression whatever. By having one of the taxicab drivers crank the motor over slowly while he watched the movement of the valves, the driver soon located the cylinder with the weak compression, and found that one of its inlet valves was stuck in the wide-open position. A screwdriver then was used to push downward on the valve-spring and the valve snapped shut.

The motor then was started and ran with the utmost regularity until the driver again opened the throttle wide and raced the motor, when the misfiring again took place even when the throttle was retarded. A glance at the valve showed that it was again stuck in the open position in the guide. The onlooker who previously had made the suggestion about testing the compression, again came to the front and asked if the valves had recently been ground in; and being assured that they had, suggested that the valve-stem might have been bent in removing or replacing it and that if the driver were to keep from running his motor at a high rate of speed, he undoubtedly could drive the car without trouble until the valve-stem could be straightened or a new valve fitted. This was another good tip.

May Damage Radiator

Owing to the accessibility of the radiator filler cap and the convenience of its position, the inexperienced motorist almost invariably chooses it as the most effective point to apply his power when required to move a car about the garage. This is an evil practice, for there are a number of cases where the filler pipes have broken away and caused the person applying his power to it, painful injury. One case in particular is remembered by the writer, where the filler pipe gave way, and the person who was pushing on it seemed to have been taken with a sudden desire to bite a chunk out of the top of the radiator. This person now wears a number of false front teeth, and his upper lip is scarred in a way that does not enhance his beauty. Aside from the physical injury possible to the operator, considerable harm in the way of leaks has been done to many radiators by pushing on them to move the vehicle backward.